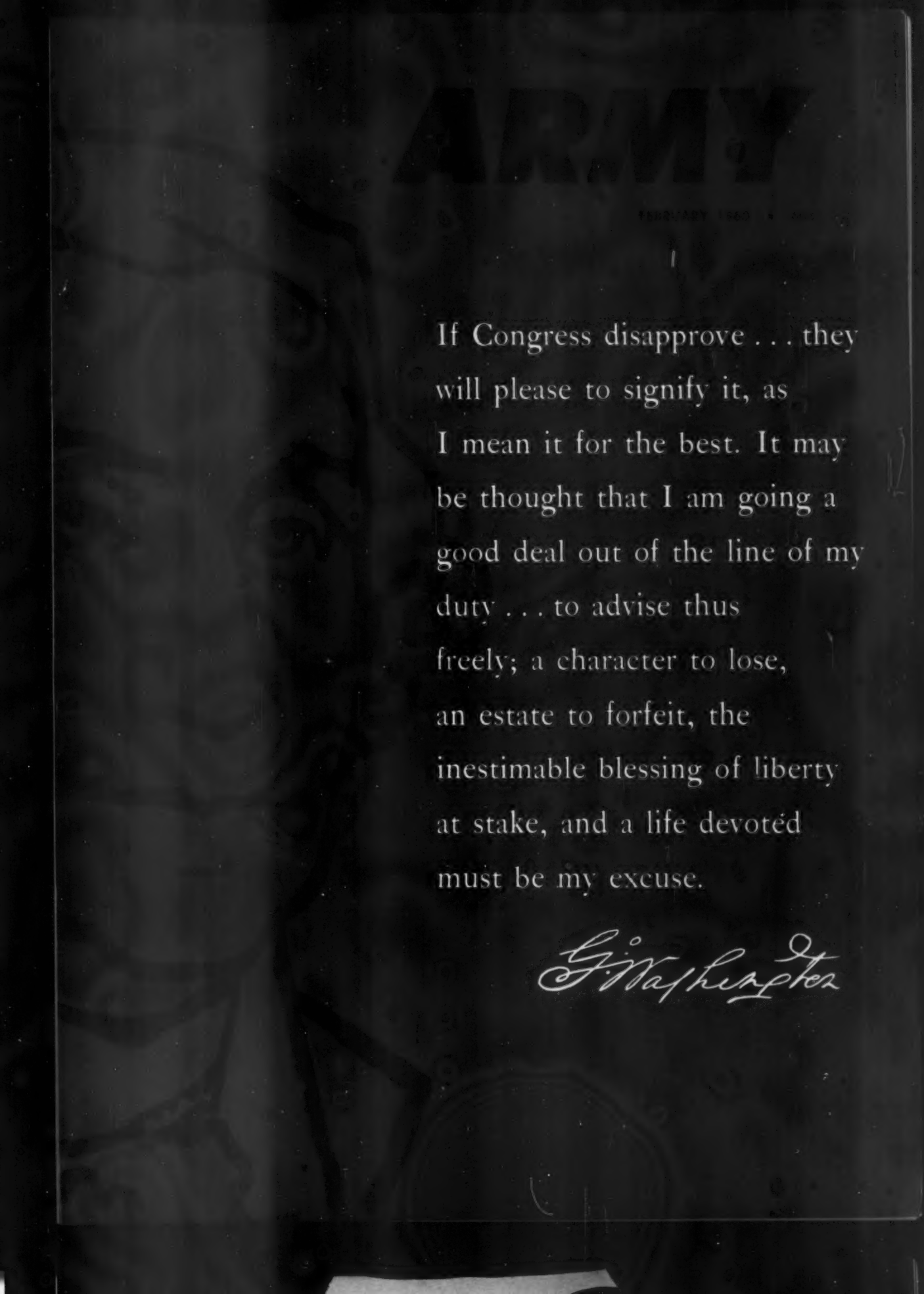

If Congress disapprove . . . they will please to signify it, as I mean it for the best. It may be thought that I am going a good deal out of the line of my duty . . . to advise thus freely; a character to lose, an estate to forfeit, the inestimable blessing of liberty at stake, and a life devoted must be my excuse.

G. Washington

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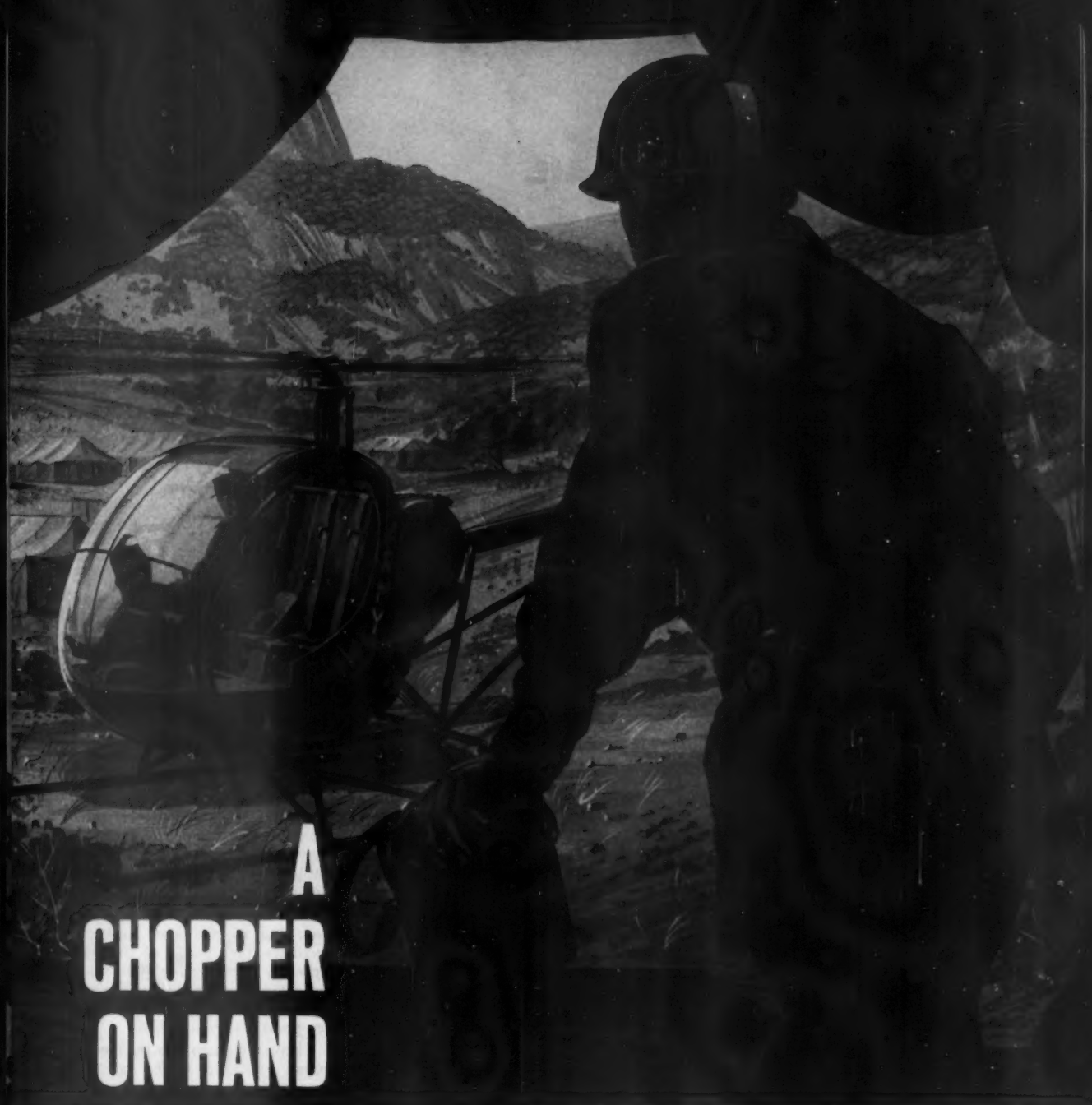

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THE MONTH'S MAIL

EASY TO SAY "NO"

● I want to congratulate Master Sgt. Forrest K. Kleinman on "The Do-ers" in the December issue.

It is really discouraging to note that there are so many people in positions capable of implementing ideas who find it so easy to say "No" or "Impossible" without first considering the suggestion or idea.

CAPT. ROBERT W. FRY
Seattle, Wash.

EVERY MAN UNTO HIS PLACE

● In response to Major Thomas W. Bowen's article, "Downgrade Division Staffs" [December 1959], I'd like to say a hearty Amen. In my experience as operations sergeant and sergeant major, I've seen units, other than divisions, overstaffed and properly staffed, depending on the whims of particular commanders. My observation generally has been "the heavier the staff, the lower the efficiency."

Major Bowen's idea of firing the incompetent applied to both officers and noncommissioned officers would, I think, do more to boost over-all efficiency than any program of management improvement I've witnessed in more than 16 years of service.

We could take a lesson from Gideon in Judges.

MSGT. DALLAS L. REDDING
Fort Jackson, S. C.

CHATTAHOOCHEE CHOO-CHOO

● Wouldn't it be of great reader interest if you ran in each issue a one-page picture-text feature of historic interest—places, people or scenes of interest to the combat arms?

The accompanying Signal Corps picture should stir the memories of readers who learned their trade at The Infantry School. Engine No. 11 of the Fort Benning Narrow Gauge Railroad pulls a student-laden string of cars across Langwell Ridge, en route to the area of a tactical problem during July 1941. This rolling stock, originally produced for the use of the AEF in World War I, served the School from 1919 until 1946 as a carrier for students, logs, coal, garbage and manure. Its thousands of passengers included the most famed of our WWII leaders and a wide assortment of distinguished visitors. For the VIPs, a Mr. Kuykendahl was engaged as conductor, in as much as he owned a uniform with brass buttons and a pair of white kid gloves. This touch, in the words of a former engineer, "added a little dignity."

The Chattahoochee Choo-Choo rolls

Called the Dinky Line by those connected with its operations, succeeding generations labeled it AEF Special, Bullseye Special, Contour Limited, Old Fuss and Feathers, Toonerville Trolley and, finally, Chattahoochee Choo-Choo. One locomotive and the VIP observation car are on display at Fort Benning, but less noticed are thousands of feet of the narrow-gauge rail that remain on the post as guard railing.

I am compiling a history of this railroad, and request from ARMY readers anecdotes, photographs of the train, descriptions of family life at Benning during the early days, technical data from former operators, and information of similar projects at other posts.

I hope the photo jogs the memories of former passengers to the extent that I can do a more complete job on the railroad's history.

MAJ. ROLFE L. HILLMAN, JR.
404-B Lumpkin Road
Fort Benning, Ga.

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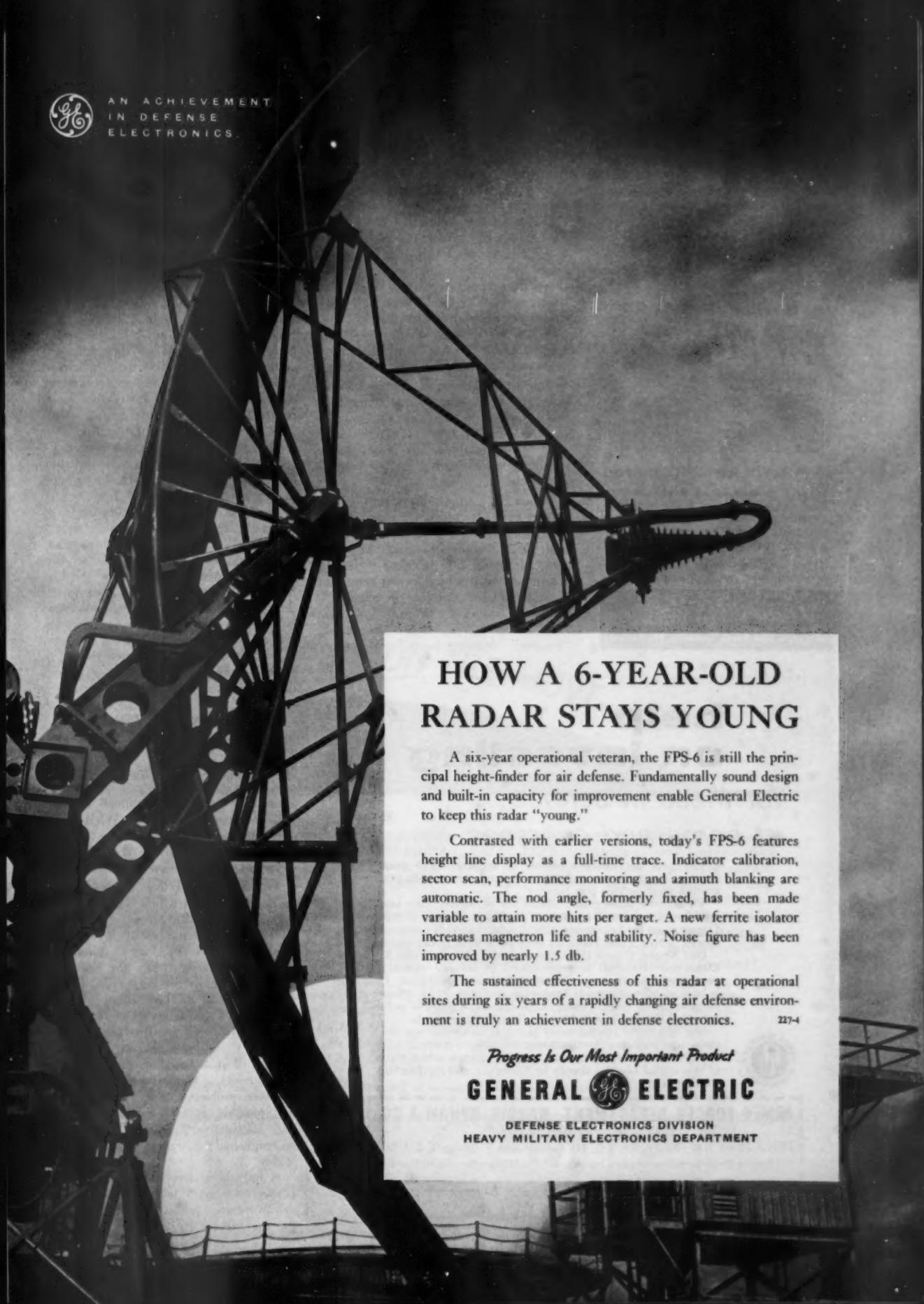
THE OTHER SIDE OF THE "8-BALL"

● In reading "The Month's Mail" in your December issue I was disappointed to learn that the most unmilitary article ever to appear in a service journal had been voted a hit. I refer to that piece of fiction in the October issue entitled "The 8-Ball Express" which began with its officer hero asleep at his desk on page 30 and ended with him in that same condition on page 51. The article was extremely well written and, in certain



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places, very touching; but the humor, for which most of your readers had nothing but praise, was in most instances unmoral, unmilitary, and disgusting. I wonder how many of your readers who asked for reprints and considered the article to contain "a great deal of sound guidance on the subject of leadership" were able to detect the following:

The senior officers in the plot comprise:

▶ A loud-mouthed, uncouth, ignorant battalion commander who spends most of his time reading comic books and bypassing his staff to issue unauthorized sadistic instructions.

▶ An adjutant who strolls back from coffee call to get the news of the new provisional truck company second-hand from his assistant, and is politely informed by that distinguished officer, "Oh shut up! Unless you can give me some help."

▶ A colonel of Engineers wearing a "tarnished eagle" who dresses our hero down for properly reporting to him with the remark, "For God's sake, stop making like a Prussian drill sergeant."

▶ A general with an ulcer who "threw a considerable amount of weight around camp in spite of his five feet four inches."

Our hero, assigned to command a company comprising one officer (himself), a first sergeant, and an unknown number of men, "hardly one" of whom hadn't been "court-martialed at least twice," demonstrates his sterling leadership qualities by the following:

▶ When his men are disrespectful, he at first in cowardly fashion sneaks into his office to get away from their jeers and fight back "unmanly tears," but later most admirably (?) threatens to beat to a pulp any man who does not obey him.

▶ Addresses his men as "monkeys," "a bunch of animals," "scum," "goof-ups," "foul balls," "thick heads," "hoodlums," "hyenas," "drunken bums," and "creeps" upon whom he "wouldn't wipe his boots."

▶ Ridicules his commanding officer in an address to his enlisted men by referring to him as "The Fuhrer."

▶ When his requisitions for equipment are disapproved, organizes and leads his unit as a gang of thieves and lock-pickers. When he is queried by various authorities concerning the criminal acts of his hoodlum pack, he lies through his teeth "with all the heat of outraged innocence."

▶ Instead of maintaining his position as an officer he moves into the billets with the enlisted men, grabs a wrench, and helps the mechanics work on the trucks.

▶ After a few days of this, he dons civilian clothes in the true bohemian fashion of the non-uniformed officer of our time and heads for the officers' mess, where he proceeds to get drunk, spouts alcoholic philosophy to the enlisted bartender, and insults his fellow officers by snorting "audibly into his glass" as they enter, and assaults one of the group who makes a joking remark to him.

▶ Maintains such high standards of housekeeping and adminstration that a drunken Wac can come into his organization and despite "years of discipline in the presence of idiot officers" tell him truthfully that "the motor pool is too dirty," "the men oughta change clothes before going to chow," the food is poor, and so on; and proceeds to put everyone to work, including the first sergeant, cleaning the filthy place to a greater degree than our hero "ever thought it could be."

He allows the same Wac to post a sign on the orderly room door reading, "WIPE YOUR FEET, YOU BUM!"

In the grand finale, our hero demonstrates his great qualities as a leader by asking his men at the crucial moment when a decision is needed, "What do we do?" He then listens to various juvenile remarks addressed to the "boss" and accepts the vote of his men as his decision.

In order that I not be accused of rendering criticism which is in other than a constructive vein, please allow me to offer a few experiences of my own in commanding two provisional units. The first of these I formed as a first lieutenant from substantially the same type of material palmed off on Lieutenant Shipp. I was given a building which had been severely damaged by fire in which to house my company. While I had the support of good battalion and regimental commanders, it was expected that I solve my own problems to the maximum extent possible. It took a lot of leg work and salesmanship on my part, but I accomplished my mission legally and honorably.

A few days after assuming command I was confronted with what amounted to mutinous conduct on the part of the majority of the men led by a rene-

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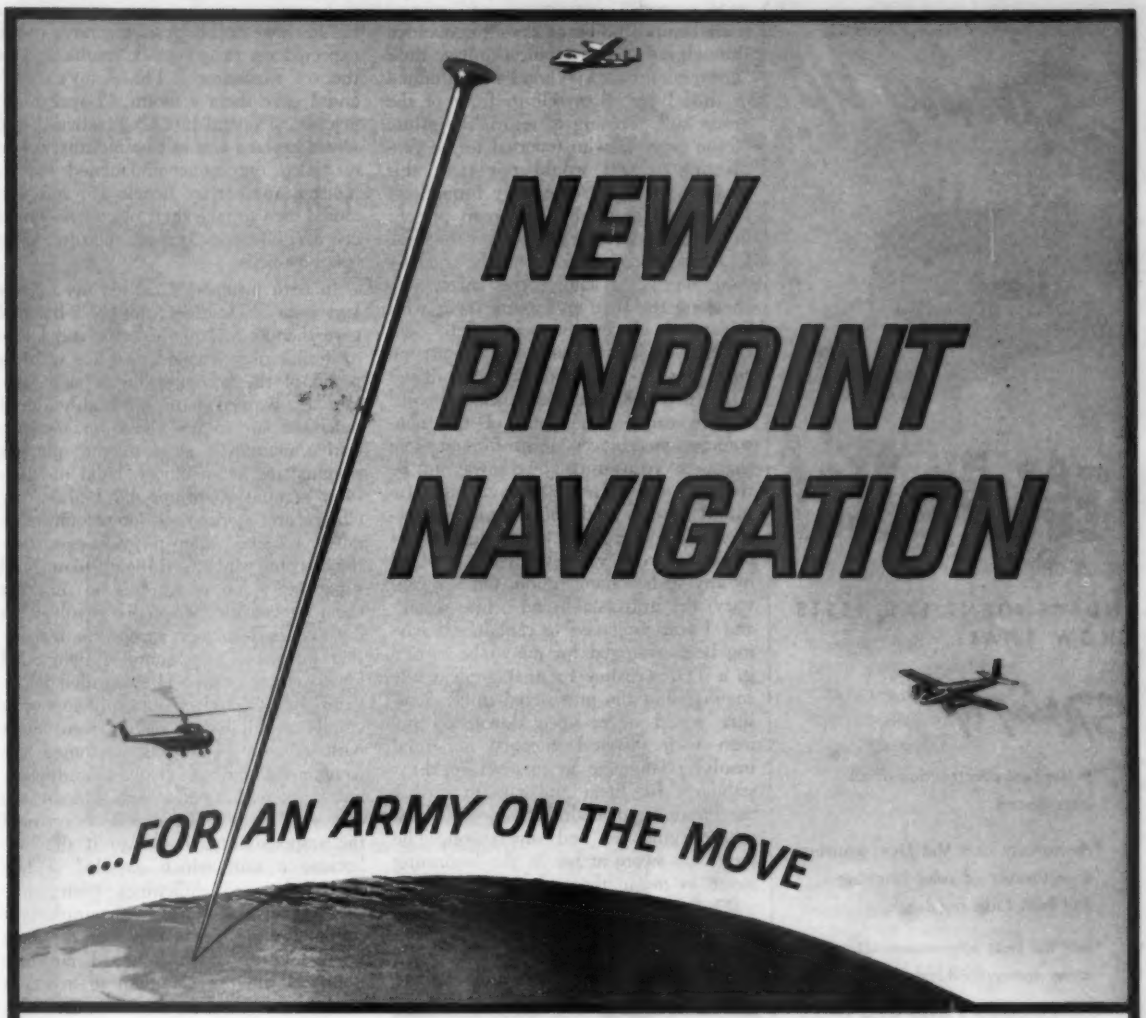

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gade corporal. This group had formed itself behind the barracks and demanded through my executive officer to have their "grievances" heard. When I was informed of this, I placed myself in front of the group and, refusing to return the salute of the corporal who reported to me (explaining that I would not treat this mutinous body as a military formation) I informed them that any man present in the area thirty seconds from the time I looked at my watch would be tried by court-martial. I ended the matter by checking the time and fixing them with a determined countenance. (And, incidentally, I didn't have my hands on my hips like an angry schoolboy.) They fled the area like flushed rabbits. I then called a meeting of the noncommissioned officers and informed them that the corporal involved was to be reduced at once, and that in the future I would hold them personally responsible for any such action on the part of their men. I was never again troubled by any such demonstration. On the contrary, the unit established a fine record, and I was promoted to captain (it having been arranged for me to be carried in a TOE vacancy for that grade while commanding the provisional unit). I assure you I never once threatened my men with physical violence nor used insulting language to them. I set high standards for them and saw to it that they were attained through proper measures of guidance and supervision. The men who swore at me in the beginning swore by me in the end.

The second unit I commanded as a major, although the table of distribution called for a lieutenant colonel. When I assumed command, I was told by the commanding general that the unit was at the lowest ebb possible and that he expected me to get quick results. I gave them a nickname: "The Army's Best"; and I gave them a motto: "Loyalty, Efficiency, Dependability." I relieved the senior captain within two months, court-martialed one noncommissioned officer, reduced another by Article 15, and promoted men to take their places. As stated on my efficiency report, results were "phenomenal."

In both instances I treated my officers and men as soldiers, not as 8-balls. I gave them a goal to shoot for and I saw to it that they reached it. They were as proud of the accomplishment as I was. We all worked hard, and although I remained late in my office, on administrative matters, I slept in the quarters assigned me as an officer. I did not perform manual labor nor did I allow my officers and noncommissioned officers to do so. I trained them to understand that they were paid to initiate, plan, and supervise—a job which left no time for them to become personally involved in detailed performance except for instruction purposes. I gave and I demanded loyalty all the way. The so-called "privilege" of griping about superiors was strictly prohibited. Violators were dealt with severely. I always welcomed the recommendations of all my subordinates, but I put nothing to a vote. *I* made the decisions; *I* gave the orders; *I* assumed the responsibility; *I* saw to it that *we* became a unit which excelled. I had differences and difficulties with some staff officers, at times with unpleasant results for me personally, but my unit knew nothing of it. When I ran into trouble I did not complain to my men nor write childish notes; I figured out another approach, and if necessary another, or still another, until I finally accomplished my mission.

I learned these methods from a study of military history and from the example of the fine officers under whom I have served—officers who stood for Duty, Honor, and Country in all matters on or off duty; officers who I am certain would be ashamed to learn that the principles of Lieutenant Shipp were thought to be worthy of emulation by the young leaders on duty with our Army today.

I am amazed that the editors of so valuable a publication as *Army* would print such an article as the one under discussion. I am further amazed that so many officers wrote you in praise of that article. I ask that you print this letter as another side to the picture for I believe that unless this other side is the one upon which we base our principles of leadership, we are going to destroy every semblance of honor and discipline left in our Army.

MAJ. ELAM W. WRIGHT, JR.
APO 81, NYC

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MARINES

THE ARMY'S MONTH

Monroney, MATS, Mobility. Senator A. S. (Mike) Monroney (D-Okla.), one of the staunchest advocates of more military airlift, has introduced a bill to bring it about. Senator Monroney's proposal (S. 2774), which was referred to the Committee on Interstate and Foreign Commerce, would authorize the Civil Aeronautics Board to guarantee loans made to commercial air carriers for the purchase of cargo aircraft. The aircraft purchased under the program would first have to be certified by DOD as suitable for military purposes and the carrier must contract to make the aircraft available to DOD in the event of a national emergency. The loans would be limited to $75 million per carrier; could not exceed 75 per cent of the purchase price of aircraft, and would have to be repaid within 10 years. In introducing S. 2774, Senator Monroney said, "the indispensable element in preparedness for limited war situations is mobility and in the decade of the sixties, military mobility means military aircraft."

Airlift test. "Big Slam-Puerto Pine"—a 15-day training test involving the airlift of STRAC combat and logistic units from some 20 or more posts in the U. S. to Puerto Rico—comes off next month. Commercial aircraft will fly regular MATS schedules under contract while MATS aircraft attempt the airlift job. Lt. Gen. William H. Tunner, MATS CG, is Exercise Director. Maj. Gen. Hugh P. Harris, CONARC Deputy Chief of Staff for operations, Plans and Training, is Deputy Director for the Army. Lt. Gen. Robert F. Sink, CG, STRAC, will command Army forces.

Missile Notes. The Nike-Zeus test firings at White Sands Missile Range in December were made to study structural temperature and erosion and launching operations. Douglas Aircraft, a subcontractor, conducted the firings. . . . Col. John G. Zierdt, who has been Chief of Staff of AOMC since its activation 31 March 1958, has been detailed as Deputy Commander, ARGMA, and has the job of advancing the

(Continued on page 16)

WHO SAID BARNUM WAS RIGHT?

IF we Americans were not so rational, plain spoken and ungiven to flights of fancy, we would be most discombobulated by the meaning of everyday expressions we use with great authority.

Think of the confusion that would exist among us if we did not clearly understand

—that deducing Soviet "intentions" is someway more realistic than measuring Soviet "capabilities" (is it true that students who a generation ago got a "U" at our war colleges for using enemy intentions instead of capabilities in solving G2 problems may now go to the head of their classes?);

—the meaning of "deterrent gap" and how it makes us stronger every day in every way than a "missile gap";

—that it is unrealistic to exert ourselves to get an antimissile missile but is perfectly sensible to "harden" bases which the Soviets have no doubt accurately pinpointed on their maps;

—that, by the same reasoning, no really serious attempt should be made to "harden" cities and industrial complexes, and civil defense must be treated largely as a joke;

—that 14 Army divisions, some of which are at less than full strength and two of which are heavily manned in their all important fighting elements by foreign nationals, are by some hocus pocus adequate to the challenges that may face them;

—that a three-division STRAC force in CONUS is a mighty deterrent to aggression in far corners of the world even though sufficient airlift for probably two-thirds of it is non-existent;

—that anyone is performing a disservice who suggests the present missile-bomber deterrent isn't adequate while desirable increases in Army strength and strategic airlift must take second priority to increasing the strength of the missile-bomber deterrent which is adequate;

—that the Army grows stronger as the rate of obsolescence of its existing weapons and equipment exceeds the rate new weapons and equipment are developed and produced;

—that we get more military security by spending less money on it during a time of rising prices.

THESE paragraphs are just a sample. And this is just as well, since unfortunately, there are among us a benighted few who simply lack the capacity to understand as well as they might the subtle reasoning and breadth of comprehension that can assert that we grow stronger as we plan to grow less strong. It would be unkind to use names, but we suspect there are some former Chiefs of Staff and other high ranking officers who aren't up to accepting *all* of the current cant that we have sampled here. Nor, let us sincerely hope, do some of the persons who have been misled into offering this kind of pabulum to a complacent people.

THE MONTH'S COVER. In observance of the birthday of George Washington we have selected a sentence from a letter to the Continental Congress, written on 20 December 1776, explaining why he found it his duty as a soldier "to advise thus freely" the Congress. Though the metes and bounds of a soldier's duty to advise civilian authority remain unsettled and are still much debated by soldiers and civilians alike, none has stated the ultimate responsibility better than our first Commander in Chief. *The cover design is by Tom Hickson.*

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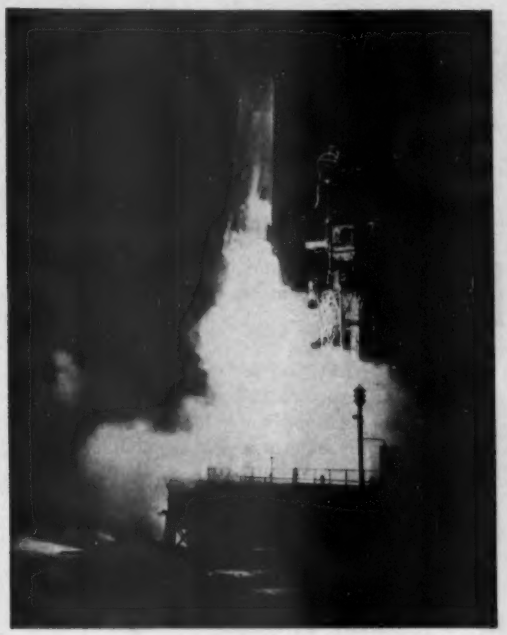
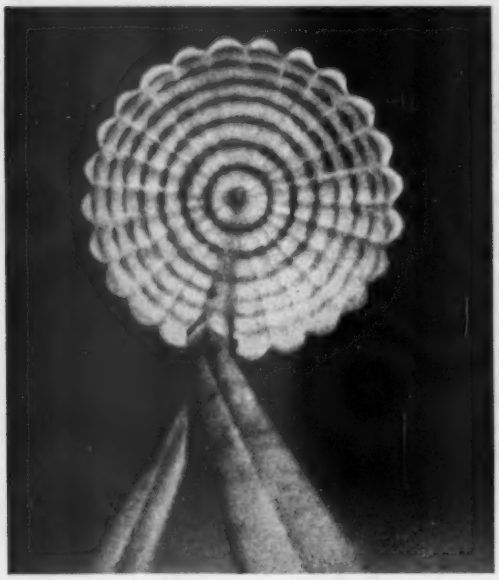


THE ATLAS MISSILE LAUNCHED NASA'S one-ton instrumented capsule similar to the one that will carry a man into space orbit. Initial landing phase began at 45,000 feet when a barometric switch fired a charge which deployed a Radioplane stabilization parachute directly aft into the airstream. At the same time, radar chaff was ejected to scatter into a 600-square-foot pattern to provide for radar locating and tracking.



AT 10,000 FEET another barometric switch initiated release of the stabilization 'chute and deployment of the 63-foot Radioplane Ringsail landing 'chute to safely lower "Big Joe" in its 30-feet-per-second descent. Upon water contact, a pyrotechnic charge released the Ringsail. Recovery was completed when a U.S. Navy destroyer, guided to the capsule by radar, lifted the undamaged "Big Joe" space capsule from the Atlantic.

NEWS IS HAPPENING AT NORTHROP

AFTER SPACE FLIGHT RADIOPLANE'S RINGSAIL BRINGS "BIG JOE"–NASA'S ONE-TON CAPSULE–TO SAFE LANDING

Recently the Space Task Group of the National Aeronautics and Space Administration sent its "Big Joe" capsule into space and successfully recovered it hundreds of miles down-range from Cape Canaveral. The landing system included a 6-foot conical ribbon stabilization parachute and a 63-foot landing parachute, the Ringsail. Both 'chutes, supplied by Radioplane, are proof of new advances in paradynamics.

Radioplane, also chosen by McDonnell Aircraft Corporation to develop and supply the landing system for NASA's Project Mercury, salutes its associates on this achievement. The success of this demonstration shows the ability to bring a man home safely after orbital flight.

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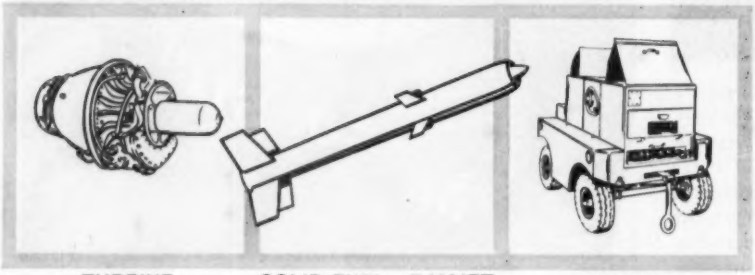

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THE ARMY'S MONTH

(Continued from page 12)

Nike Zeus antimissile missile program. . . . Dr. Nils L. Muench, the new Chief Scientist of ARGMA, is a graduate physicist, a licensed lawyer, and a former submariner officer. . . . the Martin-built Lacrosse SSM is being put through a series of cold-weather trials at Fort Churchill, Manitoba, by a test team of U. S. and Canadian soldiers.

Distaff Hall for dependents. Ground is expected to be broken this year for a $4.5 million home for widows and other elderly female dependents of deceased Army officers on a 14-acre tract at 6200 Nebraska Ave., NW, in Washington. The home is being built by the Army Distaff Foundation, Inc. whose President is Gen. John E. Dahlquist, USA, retired, and Executive Secretary is Mrs. Jasper Searles. A fund-raising drive for the 300-unit home is being conducted.

Wind Chill table revised. The Surgeon General's Office has issued revised instructions for use with its Wind Chill Table (published in ARMY in December 1958). The revisions appear in DA Circular 40-47, 31 December 1959.

General Officer Shifts

Maj. Gen. VICTOR A. CONRAD to OCSIGO . . . Maj. Gen. DERRILL M. DANIEL to JUSMAG, Philippines . . . Maj. Gen. FREDERICK W. GIBB to 2d Inf Div . . . Maj. Gen. FRANK W. MOORMAN to SHAPE . . . Maj. Gen. MERCER WALTER to Third Army . . . Maj. Gen. ROBERT H. WIENECKE to MAAG, Pakistan . . . Brig. Gen. AUSTIN W. BETTS to ARPA . . . Brig. Gen. LESTER S. BORK to Fort Stewart, Ga. . . . Brig. Gen. MORRIS O. EDWARDS to NATO Defense College . . . Brig. Gen. EDWARD S. EHLEN to CINCPAC . . . Brig. Gen. GRAYDON C. ESSMAN to Army Chemical Center . . . Brig. Gen. THOMAS N. GRIFFIN to XVI Corps . . . Brig. Gen. WILLIAM L. HARDICK to 2d Inf Div . . . Brig. Gen. WILLIAM E. R. SULLIVAN to Army Chemical Center . . . Brig. Gen. FREDERICK G. ZIERATH to Alaskan Command.

Retirements. Maj. Gen. CLARENCE J. HAUCK . . . Brig. Gen. JAMES I. KING . . . Brig. Gen. FREDERICK T. VOORHEES.

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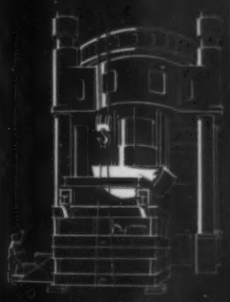

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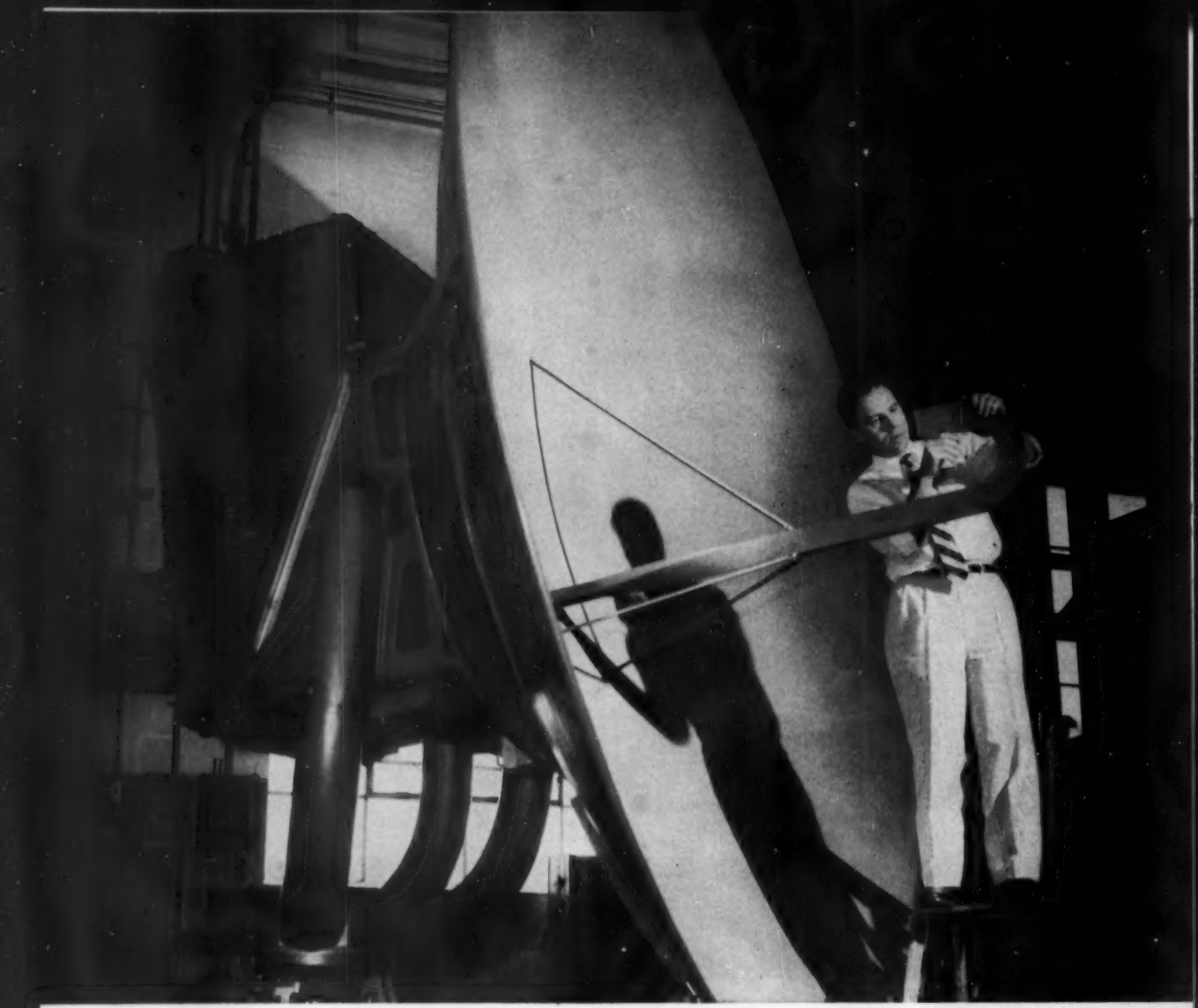


Twelve-foot diameter dish of WSR-57 "Stormfinder" radar. System operates at S band, has 250-mile range, 500 Kw output.

Now being delivered to the U. S. Weather Bureau are WSR-57 weather detection radars. Each unit covers 200,000 square miles, tracks storms, identifies rain, snow and fog. This equipment is designed and produced by Raytheon.

RAYTHEON COMPANY, WALTHAM, MASS.

RAYTHEON

EXCELLENCE IN ELECTRONICS

In this article Mr. Stevenson ably gives the pro side of the case for a functional budget for the Department of Defense. In this he reflects the reasons advanced by General Taylor and Secretary of the Army Wilber M. Brucker, and the interest in the idea expressed by Representative Mahon, Chairman of the Military Appropriations Subcommittee. Undoubtedly Mr. Mahon will hear about some of the bugs in the idea when his committee opens formal hearings. It would, of course, be good to know just how much we are spending on each of the "functions," but in practice this is going to be most difficult for the services to "break out." Furthermore, whatever benefits there may be in a functional budget would seem to disappear without the reorganization of the Department of Defense into a functional organization and a decision to do this would certainly have to be based on reasons far more persuasive than good bookkeeping.

What About the 'Functional' Budget?

CHARLES S. STEVENSON

WOULD you like to know how much it costs to defend the North American Continent from attack by enemy aircraft?

Or the amount of money spent by the United States on its Army forces stationed in peaceful foreign countries as well as in the remote dangerous spots of the world?

Or what the tab will be for the Navy to keep the necessary sea and air lanes open?

If so, you have a buddy in George H. Mahon, distinguished Texas Democrat in the Nation's House of Representatives. Mr. Mahon would not only like to know the answers to those particular questions, but to a few others. If the answers can be obtained Mr. Mahon will probably get them because he is in the enviable position of being Chairman of the House Military Appropriations Subcommittee.

His current questions are about the nation's defense bill. Actually, he isn't asking questions about it; he has "requested" that defense officials present the 1961 fiscal year defense budget to his committee by the type of protection they plan to provide the country.

To make it as easy as possible for them (the defense officials, that is), he told them he wants the information about how they plan to spend the money for which they are asking, spelled out in six general categories:

- Strategic Retaliatory
- Air Defense
- Forward Deployed
- Strategic Reserve
- Sea Lanes of Communication
- Reserve forces.

Since these six categories consist of some rather sophisticated and sometimes misunderstood military terms, the chart headed "The Proposed Way of Figuring the Defense Budget" will serve not only as a translation for the words themselves, but will present in visual form, the difference between the old way of figuring the defense budget and the new way.

The six categories, which also go by the name of missions, are not Mahon's idea, nor have they been thought up by the Bureau of the Budget or anybody in the Department of Defense.

They resulted from suggestions to Congressman Mahon's subcommittee early in 1959 by General Maxwell Taylor when he was still Chief of Staff of the Army.

Charles S. Stevenson, Civilian Aide to the Secretary of the Army for Western Missouri, here makes his second appearance in ARMY. Last month he told the Civilian Aide story to our readers.

The Proposed New "Functional" Look at the Defense Budget

(Figures are Fiscal Year 1960, estimated; in millions)

THE OLD WAY By the separate services (FY 1960 Administration Budget)		THE NEW "FUNCTIONAL" WAY By the type of protection provided (FY 1961 Budget)	
Army	$ 9,264	Strategic retaliatory attacks on enemy targets	?
Navy	11,596	Air defense of North American Continent	?
Air Force	18,675	Forward deployed overseas forces in danger areas	?
Miscellaneous	1,410	Strategic reserve forces such as STRAC and TAC	?
		Sea lanes of communication forces guarding sea and air lanes, including submarines	?
		Reserve forces—National Guard and Organized Reserves	?
Total Expenditures	$40,945		$xx,xxx

In support of his idea, General Taylor talked to many people in this general manner:

> I think that our weakness is not determining standards of sufficiency; how much is enough for atomic retaliatory force, for air defense, for limited warfare forces, for strategic air and sea lift and for Reserve type forces . . . all of these categories to which several services contribute. We never look at the problem horizontally and determine whether each function is properly supported by the appropriate forces of all contributing Services. Changing strategic requirements call for corresponding changes in the pattern of the military budget.

The idea obviously appealed to Mr. Mahon and he, too, began to make some comments on the entire problem of defense budgeting. His observations were not quite as formal or as gentle as those of General Taylor. They ran something like this:

"The present method of allocating funds to the services, rather than to functions, is outdated."

STRATEGIC RETALIATORY FORCES

Manned bombers like Boeing's B-52 and long-range surface-to-surface missiles are backbone of SAC

AIR DEFENSE FORCES

Army's Nike Hercules is ARADCOM's prime weapon defending CONUS

Types of Forces Assigned to Missions

CATEGORIES OF FORCES	ARMY	AIR FORCE	NAVY
1. Strategic Retaliatory		Bombers ICBM IRBM	Polaris Sea Master A3D. A3J
2. Air Defense	Nike Hercules Nike Ajax Hawk	Bomarc Interceptor	Destroyer Escort Radar
3. Forward Deployed	Divisions SSM units SAM units Combat Support units	Theater forces Airlift	Striking Fleets Marine amphibious forces
4. Strategic Reserve	STRAC forces Missile units	TAC MATS	Marine forces
5. Sea Lanes of Communication	———	———	Anti-submarine forces MSTS
6. Reserves	Reserves	Reserves	Reserves

"The Joint Chiefs are not the advisory group the Nation expects!"

"The Joint Chiefs of Staff do not really slug it out with bare knuckles in calculating what the requirements are."

"I am not satisfied with the manner in which the Joint Chiefs of Staff decide on force levels."

The chart headed "Types of Forces Assigned to Missions" has been offered by those favoring the plan as a sort of zero position from which to begin the study.

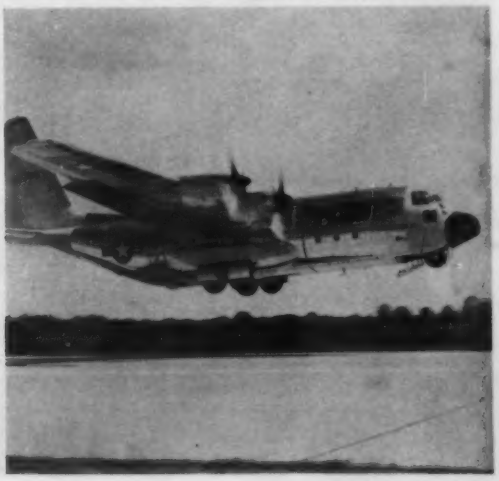
Using the Air Defense Category as an example, the method of figuring by the type of protection given would show how much the Navy wants for maintaining its destroyer escort radar-warning ships, what the Air Force needs for its Air Defense Command and the amount the Army will require to maintain the Army Air Defense Command. The three costs when added together give an easy-to-analyze estimate of the cost to

FORWARD DEPLOYED FORCES

Army's Honest John missile unit deployed in Italy backs up five Army divisions assigned to NATO forces

STRATEGIC RESERVE FORCES

Lockheed's C-130 is only modern military airlift plane available; more of many types are needed



the U. S. of defending the North American Continent from an attack. Other categories would be figured in this same way.

The chart shows the Navy, which has quietly gone its way with little association with the naughty word "duplication," as having a part in all six missions. The Army, often accused as the heaviest mustached villain in charge of duplicities, participates in only four of the suggested missions.

This new concept raises an immediate problem of how to show the "cross-service" functions in the budget, much less explain them. As an example, certain weapons and systems are multipurpose in that they can be used in more than one of the six categories.

Mahon handled this concisely. "Regardless of duplication," he insisted, "tabulate, itemize and identify manpower, major equipment, forces and costs."

Called the "Functional Budget" in military parlance, the plan should, its supporters say, show the cost of defense by missions, point out duplications of various kinds, allow fuller use of new weapons and create economies in dual usages—in a sense, further unification. One possible development could be certain unifications such as that effected in purchases, whereby the Army, Navy and Air Force are each assigned procurement responsibility for all the services.

If an ultimate distribution of defense funds is made by the proposed method, it could cause considerable dislocation in the current amounts allowed to each service, a method which has been said by some to follow a rather rigid ritual. For the past five years, for example, here is the general percentage each service has received annually in new obligational availability:

Air Force	46 per cent
Navy	29 per cent
Army	23 per cent
OSD & Interservice	2 per cent
	100 per cent

How will the Army come out under the "functional budget" presentation? No one knows—just as no one knows how the Navy or Air Force will come out.

Secretary of the Army Brucker isn't too concerned with this. In fact, when asked almost this very same question at the last Civilian Aide Conference, his answer, given quickly and hesitatingly, was this:

"It doesn't matter, if the budget is based on the needs of the nation rather than a historical figure."

Whether it will be possible to present the fiscal 1961 budget in the suggested new manner is not yet certain. Figuring it isn't as simple as it sounds, either, because it has as many detailed items as a Missile Master control system and is just as complex.

Last hazard, of course, is whether the whole Congress will buy the "functional" idea. It could well object because the new method of figuring has the possibility of causing the Congress to lose some of its hold on budgetary matters.

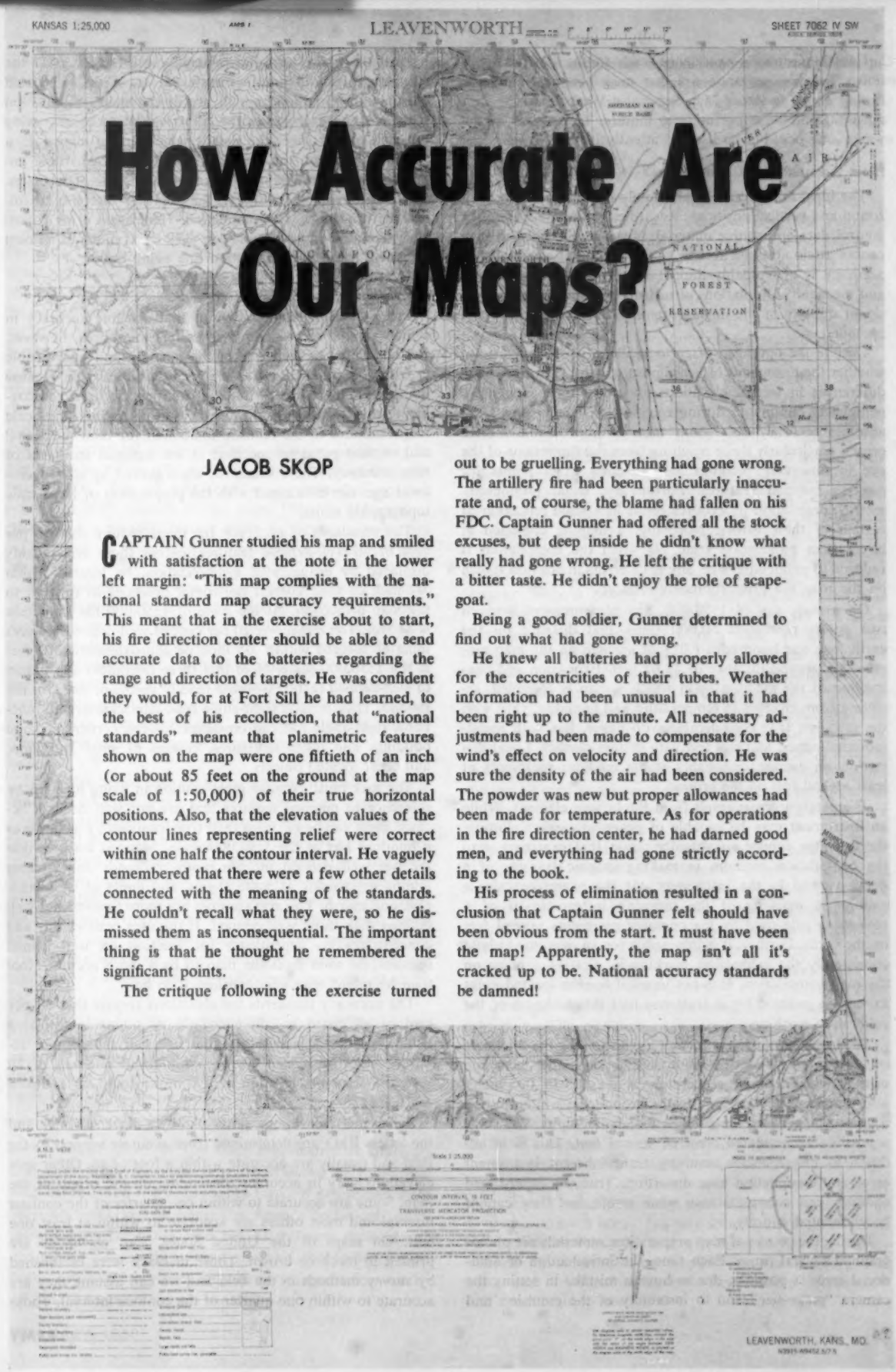
Notwithstanding all these problems, it's a reasonably good bet that this new "functional budget" will get a lot of stress in many hearings to come.

SEA LANE DEFENSE FORCES

The atomic powered submarine *Nautilus* is first of Navy's new underwater and surface fleet

RESERVE FORCES

Army National Guard and Army Reserve outfits in being will get early call up in national emergencies



How Accurate Are Our Maps?

JACOB SKOP

CAPTAIN Gunner studied his map and smiled with satisfaction at the note in the lower left margin: "This map complies with the national standard map accuracy requirements." This meant that in the exercise about to start, his fire direction center should be able to send accurate data to the batteries regarding the range and direction of targets. He was confident they would, for at Fort Sill he had learned, to the best of his recollection, that "national standards" meant that planimetric features shown on the map were one fiftieth of an inch (or about 85 feet on the ground at the map scale of 1:50,000) of their true horizontal positions. Also, that the elevation values of the contour lines representing relief were correct within one half the contour interval. He vaguely remembered that there were a few other details connected with the meaning of the standards. He couldn't recall what they were, so he dismissed them as inconsequential. The important thing is that he thought he remembered the significant points.

The critique following the exercise turned out to be gruelling. Everything had gone wrong. The artillery fire had been particularly inaccurate and, of course, the blame had fallen on his FDC. Captain Gunner had offered all the stock excuses, but deep inside he didn't know what really had gone wrong. He left the critique with a bitter taste. He didn't enjoy the role of scapegoat.

Being a good soldier, Gunner determined to find out what had gone wrong.

He knew all batteries had properly allowed for the eccentricities of their tubes. Weather information had been unusual in that it had been right up to the minute. All necessary adjustments had been made to compensate for the wind's effect on velocity and direction. He was sure the density of the air had been considered. The powder was new but proper allowances had been made for temperature. As for operations in the fire direction center, he had darned good men, and everything had gone strictly according to the book.

His process of elimination resulted in a conclusion that Captain Gunner felt should have been obvious from the start. It must have been the map! Apparently, the map isn't all it's cracked up to be. National accuracy standards be damned!

Captain Gunner's experience leads to the obvious question: Just *how* accurate are our maps? Some time later, during a visit to Army Map Service in Washington, he took advantage of the opportunity to inquire. The answer he got was a long one, but he listened attentively.

How accurate are our maps?

The ideal map would be absolutely accurate in both horizontal and vertical positions. Regardless of how accurate the control data and source material, however, the finished map cannot attain absolute accuracy. The degree of accomplished accuracy is unavoidably limited by the plotting capabilities and mechanical limitations of instruments and by the dimensional stability of the medium upon which the map is being compiled.

Despite the optimism of cartographers, it is a moot point whether the distortions of aerial photography (resulting from differences in terrain elevations and tilt during flight) are completely eliminated during rectification. Departures from absolute accuracy also result through unavoidable human errors, particularly those resulting from the limitations of the eye in observing readings and selecting exact points for plotting mapped features. Fortunately, usual photogrammetric compilation procedures result in a scale reduction of certain of these errors. Normally, a map is compiled at larger than publication scale. So when the compilation is reduced to publication size, any scale errors in position shown on the map are proportionately reduced.

On a map, say of 1:50,000, any measurement between two points represents 50,000 times that distance on the earth; one one hundredth (.01) of an inch on the map represents a ground distance of 41.67 feet. Expansion and contraction of the medium upon which a map is compiled, resulting from changes in temperature and humidity, vary with the medium. It is considerable with paper, less with metal-mounted paper, and still less with certain plastics. Local distortion on even a reasonably stable medium represents at least several feet on the ground.

The greatest errors result from the human element. While an instrument may be capable of practically exact plotting, the operator cannot consistently retain that exactness onto the compilation medium in making graphic transfer of a detail viewed in the instrument. At the example scale, a calibration marking of the mapping instrument or of a measuring rule used by the operator represents several feet on the earth. Further, it is impossible for an operator to hold consistently the calibration marking in plotting a point on the map compilation. It is not unusual for the located point to vary in position by at least one half the thickness of the calibration marking.

The error of location is further aggravated by the thickness of the compiler's plotted point or line, since the finest line usually delineated by the operator (about .003 to .005 inch) also represents several feet on the ground. So while plotting a line or a point on the compilation, the compiler can have a possible accumulated error of several feet. This is in addition to discrepancies resulting from inherent instrument error and compilation base distortion. True, an experienced operator can counterbalance some errors, but they cannot be eliminated entirely.

During the course of map preparation, materials are photographed several times. Each time, the introduction of additional error is possible, due to human mistake in setting the camera "make-size" and to instability of the emulsion and base of the film. During map preparation, the image of the completed compilation is transferred to sheets of coated plastic film. On these, which are at the map's publication scale, the engraver makes the color separation by engraving on each plastic sheet the details which are to appear in a common color on the final map. When finished, these engraved sheets serve as negatives for making the press plates. While engraving these sheets, the engraver attempts to follow the imprint of the compilation. Here again error is possible since the engraved line can vary by as much as its own thickness from the compilation line being traced.

Standards of accuracy

From these facts, it is obvious that absolute accuracy in a map cannot be attained. Permissible tolerances, however, can be limited to the mean of the inherent and unavoidable errors. This practical attitude is especially desirable because its application results in maps of uniform accuracy. Recognizing this, the Corps of Engineers, in preparing large-scale maps, adheres to the realistic tolerances for both horizontal and vertical positions specified in the national standards of map accuracy. These standards are followed by all Government agencies concerned with the preparation of large-scale topographic maps.

The standards of accuracy for maps require that 90 per cent of all *well-defined* features, except those unavoidably displaced by exaggerated symbolization, be located within .02 inch of their correct horizontal positions in relation to the map projection. At the scale of 1:50,000 the limitation is 84 feet. The remaining 10 per cent of well-defined features must be located within .05 inch or approximately 210 feet at the 1:50,000 scale. Note that these tolerances apply only to *well-defined* features—those readily visible or fixed on the ground. They include right-angle road intersections and junctions, right-angle railroad crossings, towers, corners of large buildings and other structures, centers of small buildings, and other located objects.

The user must exercise great caution in fixing location by reference to mapped features that are not well defined, because these can be off from their true locations by as much as a hundred feet at the 1:50,000 scale. Mapped features that are not well defined include roads, railroads and streams joining or crossing at acute angles, and limits of woodland, rice, and marsh. The average map has more features not well defined than those well defined. If the user realizes this and concentrates his dependence for location on well-defined features, he soon finds the map to be a more accurate tool than he might otherwise consider it to be.

The accuracy standards for elevations require that 90 per cent of all contours and elevations of points interpolated from contours be accurate within one half the contour interval. Thus, on a map bearing contours at intervals of 20 feet, the error of elevation of a contour could be as much as 10 feet.

Bench mark elevations (indicated by a black sawbuck and the letters BM) are determined from accurate surveys in the field and usually are accurate within a foot or so. Other spot elevations vary in accuracy, depending on the origin of the map. Some are accurate to within one quarter of the contour interval and most others are accurate to within at least one half. On maps of the United States, spot elevations are printed in black or brown. Those in black were established by survey methods in the field and we can assume they are accurate to within one quarter of the contour interval. Those

in brown were established during photogrammetric compilation. We can assume these are accurate to within at least one half the contour interval although often they are accurate to within one quarter of the contour interval.

Position accuracy is not uniform

The position accuracy of features shown on a map is not uniform. A survey, whether photogrammetric or plane-table, is based on a system of *control* that fixes both horizontal and vertical positions of features selected for portrayal on the map. Obviously, time and costs make it impracticable, if not impossible, to fix the exact position by geodetic survey methods of each detail to be shown on the map. In practice, the surveyed points of the horizontal and vertical control networks comprise the framework upon which the map is hung.

Each control point is an identifiable feature and serves as a peg for positioning detail between the pegs. These are the points on the map whose positions are fixed with the highest degree of accuracy. Standards of accuracy require that the horizontal position of any of these points on the map must be within .005 inch, or about 20 feet at the scale of 1:50,000. The mapped features between the pegs are positioned with relation to the pegs. Usually, accuracy of position of a mapped feature close to a control point can be accepted as being greater than that of a feature more remote.

A topographic map is a graphic representation to scale of some portion of the earth, systematically plotted on a plane surface. The ideal map would show every feature on that portion of the earth it represents, each feature retaining its true shape, orientation, and location. Even if it were desirable, such a representation is not possible. This becomes evident when you realize that on a map at scale of 1:50,000 a square mile of the earth's surface must be compressed into a space of approximately 1.25 by 1.25 inches.

If we attempt to plot each feature true to scale, the map would be difficult, if not impossible, to read. Many details would be delineated so minutely as to defy recognition without the aid of a magnifying glass. To be intelligible, mapped features must be indicated by conventional signs and symbols. To be read, the size of many of these must be exaggerated, often far beyond their actual ground limits. Using the prescribed symbols, on a 1:50,000 map a small house covers an area of approximately 85 feet square on the ground; the width of a road measures nearly 95 feet; the symbol for a single-track railroad occupies a width of about 165 feet.

Many other features require similar exaggeration. Using such a system, it is impossible to show every detail. Only landmark features can and should be shown. These are the details most important to the user and most readily recognizable on the ground. The omission of less important features detracts nothing from the map's value. Their inclusion would not only create dangerous exaggerations of position; they would also clutter the map with so much unnecessary detail as to make it difficult for the user to identify more important features.

Use only reliable references

When a map is being made, the compiler is instructed to plot the mapped features as accurately as source material, symbolization, and instruments permit. This of course is subject to the limitations we have described. The center and orientation of a symbol normally correspond with the center and orientation of the feature represented. Wherever scale permits, all line features such as roads, railroads, power lines, and streams retain variations of alignment that actually exist. Normally, the center line of the symbols of such features corresponds to the center line of the features as they exist on the ground. Important linear features which run closely parallel to one another (roads, railroads, power lines, streams) may require an exception to the rule. To show these features by their proper symbols, it may be necessary to exaggerate the area covered. The displacement is distributed evenly, with the true center of the parallel features, taken collectively, held wherever possible and with the contours adjusted to the symbols.

Displacement of mapped features because of exaggerated symbolization occurs commonly along roads and other linear features. When a building is very close to a road, the edge of its symbol is made to coincide with that for the road. When a building stands back from a road, but its truly located symbol would fall within the exaggerated symbol of the road, that for the building is dislocated sufficiently to allow a clear space between it and the road symbol. So the user can assume that along roads, symbols for buildings and similar features are located with reference to the edge of the road symbol rather than to the map projection. Such features should be used for orientation and for approximate locations and not be used as reference points to fix exact locations. An isolated building set well back from the road is a much more reliable position reference.

Still more caution must be exercised in relating location to symbols of individual buildings of a group. Often, the actual density of buildings in a group makes it impossible to show each structure on the map. When that happens, the map maker selects those to be shown. He tries to retain the characteristic pattern of the group and minimizes the distortion of area and shape. Because of the exaggerated sizes of the map's symbols, however, many of the buildings must be omitted, and those retained must be displaced, often drastically. The depiction of the group can be only representative. It would be hazardous for the user to depend upon any particular symbol of such a group for exact location.

AFTERWARD, Captain Gunner studied his map and once again could smile with satisfaction. His appreciation of the map became more realistic. Now he understood the unavoidable limitations of the map and realized that, properly used, it is a reliable military tool. The rule of thumb he devised is a good one: Use only identifiable control points and well-defined features for references in fixing relatively accurate locations; use other mapped features only for orientation and as references for fixing approximate locations.

It's as simple as that!

Jacob Skop, Chief of the User Requirements Division, U.S. Army Map Service, is a supervisory cartographer who established the procedures for and organized AMS map editing. He has been the Army's technical representative in Tripartite and NATO military map standardization proceedings, and devised the Military Grid Reference System which has been adopted for use by all NATO forces.

How American military aid helped Vietnam's National Non-Commissioned Officers Academy produce trained junior leaders

Topped with berets, a company of NCO students marches out for a day of rugged training.

Mountain training is a must. If the Vietnamese have to fight, it will be in hilly jungles.

OVER the gate leading to rows of neat buildings overlooking beautiful Nha Trang Bay on the coast of South Vietnam are the words: "Learn to Lead, Learn to Succeed."

Inside the gate hundreds of Vietnamese noncommissioned officers are busily doing just that.

Although the National Noncommissioned Officers Academy is barely a year old its influence is already strongly felt throughout the young Republic's armed forces. Over 500 noncoms have already graduated; another 800-odd are currently undergoing training; and the school is carrying out an expansion program that will accommodate more in the years to come.

In a sense, the National NCO Academy mirrors the problems, the troubles, the struggles and the accomplishments of the Armed Forces and the Republic which it serves. It also reflects the success of the American Military Aid Program in Vietnam and the small detachment of American soldiers who rolled up their sleeves and made the program work.

The school traces its origin back to the violent days after World War II when Vietnam became embroiled in the bloody struggle to gain independence and avoid the yoke of Communism. At that time it was organized as a Commando School at Quang Yen in North Vietnam. After the armistice of 1954, the school moved to South Vietnam and finally settled in Nha Trang, its present location. Here it continued to produce Commandos and added to its subjects: reconnaissance, anti-guerrilla warfare, physical training, boxing and judo. Some basic infantry training was also given. In all, it graduated nearly five thousand students.

But one of the greatest needs of the developing Vietnamese Armed Forces was not Commandos or scouts or judo experts, but trained junior leaders. When the French colonial forces evacuated Vietnam there were Vietnam-

An officer-instructor reads rifle range scores to cadets.

The Commandant is amused. Col. Van Quang and Maj. Ray H. Oestreich, MAAG Advisor, share a joke.

ese platoons, companies and battalions filled with experienced veterans, but almost no logistical or support units. Few Vietnamese officers had commanded units higher than a company; fewer still had experience in staff work.

Almost overnight some company and battalion commanders found themselves commanding divisions and corps. Junior officers who had led platoons were now senior staff officers; squad leaders and platoon sergeants led platoons and commanded companies. Few experienced noncommissioned officers were left to stiffen small units.

The great need for trained junior leaders was spotted by Lieutenant General Samuel T. Williams when he arrived as Chief of the Military Assistance Advisory Group in 1955. On 1 November 1958, the Nha Trang Commando School became the National NCO Academy. Its first class of 299 students entered a few weeks later.

The staff and faculty of picked officers and NCOs, from all parts of the Vietnamese Army, are divided into a training group and a support echelon. Supporting elements include mess, transportation, supply, finance, and administration sections which operate under the Deputy Commander for Logistics. Training personnel come under the Deputy Commander for Training and his chief subordinates—Chief of Training and Director of Courses.

The Director of Courses coordinates the various instruction programs under way. During the past year no less than six different courses were conducted: a basic course, two different infantry courses, a special OCS course, and two standard NCO courses. They ranged in length from eight weeks to ten months.

The Committee System of instruction is employed. The

Students take notes during a class on weapons. Eleven different weapons are taught at the Academy.

Pointing out a target during a tactical problem, an acting platoon leader issues orders to his troops

six Committees are: Weapons, which handles all instruction given in the 11 different weapons taught; Mines, which teaches demolition; Signal, for communication; Combat, for tactics instruction; Combined Subjects, for general instruction; and Physical Instruction, to keep the students in shape.

More than 50 per cent of the instructors are graduates of the U. S. Army Infantry School at Fort Benning.

The standard NCO course offered by the Academy lasts six months and includes 1,150 hours of instruction in a wide range of subjects. The training may be broken down into seven distinct blocks, though all subjects are carefully integrated and appear on the training scheduled in logical sequence rather than by blocks.

Basic Subjects give the student 40 hours of close order drill, 20 hours of military discipline, 15 hours of military correspondence, and 40 hours of organization, mission, and capability of units up to and including the infantry division.

General Subjects account for 105 hours and include first aid, demolitions, motor maintenance, communications, and map reading. In this category also are classes in politics, psychological warfare, government, geography, and civil affairs.

Weapons Training provides the student with 52 hours on the M1 rifle and another 138 hours with other infantry weapons. **Leadership and Instructor Training** account for 100 hours of instruction. **Tactics** takes up 210 hours, of which 50 are at night, and **Physical Conditioning** totals 140 hours, 60 of which are devoted to hiking and scaling the rugged mountains of Vietnam.

Students live in neat one-story barracks, eat in spacious mess halls, and attend classes in bright, modern classrooms. Most of the instruction, however, is given in the field, much of it at night. In fact, 80 of the training hours are hours of darkness.

A typical day starts at 0500 when the students fall in for reveille. After washing and cleaning barracks, they take an hour of PT or close order drill and eat breakfast at 0645. Morning classes start at 0730, end at 1130. Afternoon training starts at 1400 and runs until 1800 when classes return for dinner and an evening of study, unless there is night training scheduled.

Surprisingly, very few students drop out of this rugged course. There are several reasons for this. First, only the top NCOs are chosen to attend. Second, there are fine rewards for successful completion. Each graduate is awarded a Certificate of Military Achievement which puts the holder in line for more rapid promotion. It also strengthens an OCS application—many graduates later go on to earn commissions. Finally, the top 10 per cent of each class is automatically promoted one grade upon graduation.

Proof of the Academy's success is found in the reports coming from the units to which graduates return. According to these units, the goods are being delivered in fine condition. Each returning NCO's commanding officer is required to submit a report on his progress three months after graduation, and, so far, these reports have been overwhelmingly favorable. Less than two per cent have reported little or no increase in the graduate's professional worth.

Thus, in its first year of existence, the NCO Academy has firmly entrenched itself as one of the greatest sources of strength of the Vietnamese Armed Forces. That fact is not surprising to General Williams. He knew all along that it would.

The Gathering and Distribution of Battlefield Information

Colonel CHARLES W. GIBBS

THE photo you see on the opposite page presents you with some information. Of course you may have to guess just what the information is, but you have acquired it nevertheless. Before you can use this information, it must have some added information to make it meaningful. Since you acquired it in the stable form of a photograph, all we need do is to caption the photo and you have a key to all the information it contains. You are then in a position to transfer this information to another person together with any ideas you may have about it or with other related information you may care to add (analysis and evaluation).

The sum of all the information in the photo can be transmitted as a word description by telephone, as a written message which refers to the photo and gives its caption, or by sending the photo itself. This transfer will involve movement of the information over some distance, whether across the room or across the continent. The movement will be accomplished by the employment of communication.

During the time this information is being transferred, it is most vulnerable to interception by a third party. Communications security is one of the knotty problems of the battlefield. For when we invoke security measures designed to keep the enemy from getting our battlefield information, we usually slow down the movement of friendly information as well.

Communications (movement of information) presents some knotty problems too. Our forces are becoming more mobile and more widely dispersed thus injecting movement and distance, both the antithesis of easy communication on the battlefield.

Both the movement of battlefield information and its denial to the enemy are simple by comparison to the difficult processes of acquiring accurate and timely information about the enemy. For example, the acquisition of target information is high on the list of the most difficult problems in any modern missile-equipped army.

The temptation to guess

There are times in combat when the commander and his staff must make life or death decisions with only fragmentary or at best sketchy information available to them. When a situation like this arises, and the pressure for a decision mounts, good staff officers usually start filling in the gaps or unknowns with "assumptions" and "estimates."

In the bygone days when the tempo of the battlefield was slow, this filling in the gaps with guesses was usually not serious. There was usually time to "revise estimates" or "modify assumptions" even while troops were getting into battle positions. All that was needed was to move the new information fast enough to overtake our own advancing troops. This could be done even by mounted messenger. With the more sophisticated electrical means of communications, moving the information from where it was to where it was needed could be accomplished at speeds greater than the movement of even the fastest troops.

With the advent of modern weapons systems with automatic built in accuracies many times greater than the accuracy and speeds of the men who must operate them, the time honored practice of getting along with only partially complete information must be abandoned. And with the very survival of whole armies and whole civilizations at stake, no man, however intelligent he may be, should be allowed to gamble by assuming that something is fact, on which he does not have solid, concrete information.

If we assume that the picture contains partial battlefield information and that a wrong guess is the equivalent of your losing at Russian roulette, the additional information in the caption (which I will give you later) becomes increasingly important and its accuracy cannot be left to guesswork or to what you "think" it might be.

After solving the manifold problems of acquiring information and developing acquisition techniques which will actually minimize guesswork, we still must move the information rapidly and we must minimize the delays inherent in our present systems.

In addition to the two villains of communications—mobility and dispersion of modern combat—there is a built in inhibitor to the rapid and efficient flow of battlefield information in our present arrangement. In fact, some communicators have gone so far as to call it a "bottleneck in the communications system." It is called a headquarters.

Headquarters a bottleneck

One of the primary functions of the staff of any military headquarters is to keep the information of that headquarters continuously updated and readily available. Here the pieces must be fitted together to make as complete a picture as is possible. While the staff is thus engaged, it must receive new information over the communications system or fill in the gaps by "estimates" and "assumptions." In addition, it must evaluate and sort out fact from assumption, transmitting facts and orders out over the communications system to other headquarters. This takes too much time. The use of the word "evaluate" as a cover-up for lost paper is classic. We must eliminate the practices within headquarters which tend to bottleneck, and must accelerate development of techniques which promise to expedite the handling of information. Further mechanization of our general staff procedures for accumulation and storing information is a *must*. Making maximum use of mechanical and electrical devices for the *automatic* storage of information in lieu of our present system of "logging," "filing" and chart keeping should be accomplished without further delay. If this is not done and communications techniques continue to improve at their present rapid rate, the headquarters will indeed become a real bottleneck. The mechanics of speeding decisions could well be the difference between accurate, dominant control of our powerful weapons, or abject incapacity to exploit them to their potential.

Communications progress unlimited

In the field of communications there are no such inhibitions. As a matter of fact, most of the present advanced concepts of battlefield communications are based on prin-

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ciples which have been time tested by the communications industry during war and peace. For example, the combat area or so called "area system" of battlefield communications is based on the same fundamental principles of communications as the telephone "terminal strip" on that pole across the street where your phone wire and those of several of your neighbors are connected into a common "area center" which in turn is connected to the distant central office by a high quality low loss cable or carrier system.

The "radio-wire integration feature" which is to be placed in the hands of troops in the Pentomic Army bears a striking similarity in principle to the system of telephones on trains leaving Washington daily which can place calls (via radio) to Mama as the train speeds across Pennsylvania to let her know that "Daddy made the 5:15." Mama can receive these radio calls by telephone while Papa is doing 60.

The point is that the solution of purely communications problems (i.e. movement of information from place to place around the battlefield) is making faster progress because: (1) there is a broader base of experience and know-how to draw from in their solution; (2) whole industries as well as the Army are engaged in communications day-to-day operations and consequent improvement on a 24-hour-a-day basis in peace or war. So the Army has plenty of help in the communications electronics field. In view of this collaboration, it is quite natural that the art of movement of information and the science of communications in general should progress at a faster pace than either the acquisition techniques or the communications security techniques.

Can anything really significant be done to increase the overall efficiency with which battlefield information is acquired and withheld from the enemy? Is the fact that these two vital areas lag basic communications developments solely attributable to the fact they are purely military and thus depend to a degree on actual battlefield operations to improve the doctrine for their employment?

The answers to both these questions depend on what we do about our present techniques within headquarters. These all-important answers also depend on the objectivity with which we can look at the entire process of handling battlefield information and our willingness to improve our entire combat information techniques to the point where they will be compatible as an entity with the efficiency, flexibility, mobility and security potential of our modern weapons systems. Our willingness to revise and improve staff techniques with which we are all familiar but which despite tradition, may not be efficient enough to handle information for weapons of the future.

For example, placed in perspective and looking at all three of these subfunctions as parts of the total process of efficient battlefield information techniques, our present doctrine should be carefully re-examined with a view to increased efficiency of the whole.

Battlefield information handling process

Let's return to the captionless picture for a moment. First of all, let's confess that it is printed upside down.

Let's assume that the picture (No. 36) was received at a headquarters by messenger. (Okay, so let's put the messenger in a helicopter.) A message was received at the same headquarters which contained the following information: "Number three six caption—Hawk missile destroys F-80 jet at coordinates blank blank." The staff officer by way of evaluation noted two additional facts: the nose wheel and a wing tank of the jet were apparently whole and the coordinates given were not far from the headquarters of a subordinate unit.

Had the plane been enemy, it would have been easy to dispatch personnel to the scene to gather more information. Together with results already on hand, this picture could have been sent to a higher headquarters by secure electrical means. Thus simultaneously moving the information and denying it to the enemy. Or it could have been delivered by the man in the chopper.

The concurrent development of devices and techniques to acquire battlefield information, to move it rapidly and efficiently and to deny it to the enemy, can be accomplished more efficiently on a single system basis. If approached from this viewpoint, all the resources of the Army in this field of endeavor can be coupled with those of the vast commercial communications electronics capabilities to solve those inherently related problems whose solutions are being delayed unnecessarily by the more or less arbitrary divisions of our effort among several staff agencies which currently have major responsibilities with respect to various parts of the battlefield information picture. Responsibilities in this field are currently so diffused and overlapped that we face the unhappy specter of a superb Army, equipped with super modern offensive weapons but still retaining a horse and buggy concept of battlefield information which limits the Army's overall reaction time to horse and buggy speeds and inhibits control to the point where gains in destructiveness are offset.

To cite some specific areas where more "unification" within the Army is needed:

(1) The acquisition of information about the enemy is being pursued down several avenues by several staff agencies, troop units and other activities under the various headings of intelligence, reconnaissance, surveillance and even sky cavalry!

(2) The movement of information is complicated by the fact that each of the above agencies attempts to provide itself with its own private communication system. Thus superimposed on the overall Army system, the efficiency of both are reduced by the overlap.

(3) Keeping our information from the enemy is divided up between several Army agencies variously charged with general security, communications security, cryptographic security, electronic warfare, ad nauseam.

For proof of just how far we have gone in assignment of responsibility based on staff arrangements rather than the job to be done, let's just look at a radio receiving set for example. If it listens to the enemy to acquire information, it is the responsibility of one staff agency. If it listens to friendly stations, it is the responsibility of another staff agency. If it listens to a transmitter in a friendly communications network, it is the responsibility of a third staff agency. Still the receiver requires identical skills for its operation and identical techniques for its employment in all three instances.

Let's modernize our Army doctrine for handling battlefield information. Designate some*one* to develop an efficient overall system for handling battlefield information. Then and *only* then delineate clearly the responsibility for its *operation*. Staff agencies can then concentrate their full energies on using the information the system provides.

The Reprimand

An effective guide to the almost unknown art of verbal chastisement

CAPTAIN ROGER W. LITTLE

DURING every troop leader's career, there comes a time when the power of positive persuasion fails and a member of his unit must be brought up short. A sequence of petty offenses, an arrogant act of insubordination, an obvious flouting of the rules—these may not be affected by an exclusively affirmative orientation. Unfortunately, our indoctrination in "the psychology of leadership" has failed to deal with this recurrent phenomenon. Instead, skill in administering a reprimand has been considered a behind-the-barracks handicraft, a lost art of "the Old Army" or a crude and last desperate attempt to change the direction of an errant soldier.

The administration of the reprimand is an essential skill for every troop leader. It can be rationally formulated. Effectively used, it may reduce the number of offenses requiring company punishment or court-martial. It recognizes the diversity of motives among men and the simple fact that not all respond to positive sanctions or presumed rewards. Often a line must be drawn: forcefully, aggressively, and definitely. A troop leader is not well equipped unless the skill of administering a reprimand is included in his kit.

As both soldier and sociologist I have studied the reprimand. First, I have been exposed to methods used by superiors: some used it well, others never touched me. In turn, I have used it on my own subordinates, with the same results. I have talked to many troop leaders to determine what techniques they used and with what results. Some have no method; they react impulsively, frequently haphazardly, and thereby lose the opportunity to exploit a momentary lapse in conformity. Among those who use a method, however, there is an amazing similarity in the pattern of the reprimand. Here it is.

Timing is the first mark of the effective reprimand. The period of expectation is prolonged by casting a hint that the formal ceremony will occur at some vague point in the future. The offender must then wait. As the hour approaches, anxiety quickens. Anticipating the elation of "getting it over with," major personality changes often occur during this period. Often the offender becomes moody, seclusive, loses appetite, and yet superficially appears the personification of good behavior.

There is a limiting point, however. If the time is projected too far ahead, two things can happen. First, the leader may forget the details of the delinquency, or he may lose that initial burst of enthusiasm that makes for a highly effective reprimand. On the other hand, during this uncertain interval the offender himself may regain his peace of mind and have strong defenses prepared when the event actually comes.

When the offender reports for the ceremony he must be immediately impressed with the gravity of the occasion. The place and physical environment in which the reprimand is to be administered is thus of great importance. The commander should be at his home base, on his own familiar ground. The offender, in contrast, should discover himself in a strange, unfamiliar, awe-provoking setting, cut off from all the supports he might ordinarily expect to provide comfort and solace in similar moments of trial. This, incidentally, is the functional basis for forbidding loitering in the orderly room: it should always be respected as a sacred place. It is no longer considered in the same way when it becomes a familiar place for intimate conversation.

Initially, the commander must appear supreme and—for the moment—omnipotent. The net impression to be conveyed to the offender is that he is to be subdued and overwhelmed. In relation to the commander, the offender must feel that he hasn't the slightest chance of beating him, outguessing him, or in any way rising to the commander's height of authority and prestige. Then a momentary period of grace is created in which the offender may indulge in the fantasy that all is forgiven. With some exaggeration, a touch of reverie and a dash of nostalgia, the commander recalls mutual experiences in which a higher standard of behavior was attained. He indicates that these fond memories are the only basis for a continued interest in the offender. In effect, the culprit is placed on a pedestal that can be quickly pulled from under him.

Often, serious errors are made at this point. Carried away by his nostalgia for old times, the commander relaxes and offers the offender a cigarette, or asks him to be seated or to stand at ease. This breaks the spell prematurely. The commander is mollified and the delinquent's tension fades. Smoking should *never* be permitted at this time. The period should be short, marked by graceful pauses and gentle reveries. Then—

The Whammy!

The pedestal is quickly and roughly withdrawn and a deep hole substituted. The commander abruptly terminates the friendly personal relationship that seems to be building up and makes it a coldly formal business. The delinquent will go along with this; he feels guilty and wants to start off with a clean bill. Properly, he should be reduced by terms of reference to the next lower level of status.

Thus, if he is an officer it would be said that he acted like an enlisted man. If he is a senior noncommissioned officer, his behavior might be compared to that of a recruit. If he is a recruit, you have trouble: he may consider it a compliment to have it said he still acts like a civilian. Then it is necessary to use one of some subgroup of civilians, such as "bum" or "hood." This implies that he didn't act like most decent civilians would have in similar circumstances. The important point is to remove the pedestal entirely, knock out all the props that sustain the offender's deviant ways of thinking and acting. He must be left with nothing to stand on, until the commander offers something: the new standards of behavior to be expected of him.

It is not sufficient to indicate that the offender has merely lost face with the commander. The actual provocative incident should be expanded to a vast panorama of implications for the offender's career, his relationships with other persons—especially his peers. He should be led to think of his peers as now despising him in reality but concealing their contempt behind a façade of apparent solidarity. He may then feel that his own buddies have been on the commander's side all the time. Since he has to live with *them* rather than with the commander, his decision to change his way of life is reinforced.

Often, when the offender is an officer or a noncommissioned officer, he must be reminded that he stands for something he must live up to: the standards of his status group. When he fails to maintain those standards, they are correspondingly tarnished, even destroyed. And because *he* did it, all others who come after him will remember that it was *he* who made it more difficult by failing to do his part. The heroic image of martyrdom thus is blocked by substituting the more powerful fantasy of a lynching.

The path to salvation

If the foregoing five steps have been carefully followed, the delinquent now is in the most receptive psychological condition. Shocked and shamed, he is eager to regain the pedestal so roughly withdrawn. This opportunity must be exploited to secure the highest possible commitment to momentarily exaggerated standards of behavior. The offender is in such a condition that he will grasp at anything to escape. Never let his grasp loosen. He may never be in the same position again. Set the standards high: he will have that much more to work for in regaining the path to salvation.

The offender should never be permitted to leave the ceremony in a state of doubt as to what he must do, or what the commander expects him to do, in the future. If he leaves in a state of doubt the delinquent will almost certainly resolve the doubt in his own favor, by making clever personal interpretations, or by exploiting the slack in the law that the commander has laid down ambiguously. Force him to make a decision, then and there. The road to salvation must begin with an about face.

Post-operative relations

After the ceremony has been concluded, in his daily round of activities and inspections, the commander must reinforce the offender's changed self-conception. Now the culprit should be treated as he was before the offense occurred; no grudges retained. The delinquent must now think of the commander as a powerful person who once lost confidence in him. But having paid the price of a skillfully administered reprimand, the offender can regain that confidence by faithful adherence to the stipulated standards. Should the commander continue to watch the offender with exceptional vigilance, or to remind him of the incident—especially in the presence of his peers—the effect of the reprimand will be destroyed. The trance will be broken and the penitent will become a rebel.

In summary, this has been an attempt to set down, in a systematic way, the principles involved in administering a reprimand. They have been arranged in a time sequence. This is a pattern that has worked for many troop leaders. It can work for you.

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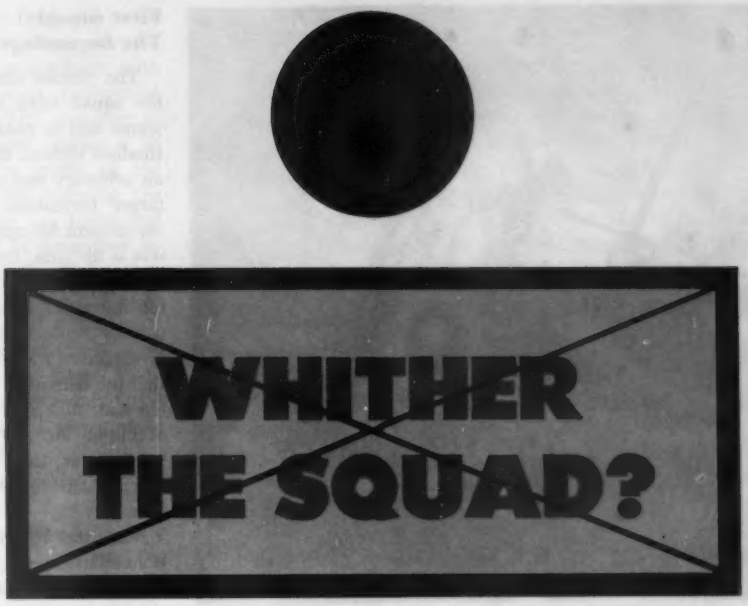

The lone black dot in our system of conventional symbols signifies the squad, a unit that has historically fluctuated wildly in strength and capability. But the promise of greater mobility and firepower heralds new importance for this basic battle team

Colonel ROBERT B. RIGG

Illustrated by the author

THE lowliest combat unit in military history—the infantry squad—promises to become one of the most significant tactical elements of the future. During almost five thousand years of recorded warfare, the squad never gained any great measure of tactical importance on the battlefield. Actually, it was essentially matured in the blood-soaked mud of trench warfare. Conflicts following World War I added to its importance, but the next 15 years promise that the squad will become unusually important. There is promise too that in about nine years the squad's combat power will be much greater than that of the current platoon. Prior to achieving this power, it will probably be given a new name commensurate with its ultra-modern importance. In short, its designation of "squad" should become obsolete in the next decade because this small unit's role will be placed in a new perspective.

For centuries military planners have been designing combat units. As a result, platoons and squads, in effect, have become the organizational by-product of a process of subdivision whereby larger units were arbitrarily broken up into smaller packages. Rather than being a well-made brick for the over-all organizational structure, historically the squad has been simply a mathematical subdivision of the whole. However, atomic weapons and other technological developments are forcing us to reexamine this ancient process of organization. Unit functionalism, determined from the bottom up, is the organizational keynote for the future.

Today's weapons and those foreseeable for tomorrow suggest that we organize combat elements on a foundation-to-roof basis, using where pertinent the building-block process of establishing common organizational "bricks." The squad or its equivalent is the basic building block. If the squad is on the verge of such new combat importance, why hasn't it had any significant tactical importance in thousands of years of warfare? Part of the answer lies in the past's comparative deficiencies in weapons, communications, and mobility. Modern technology is about to provide the squad with a quantum jump in combat power. We get a better understanding of the contrast between future and past by opening some of Time's capsules.

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The Mongol squad of ten mounted horsemen was without tactical significance.

The Spanish tercio *of the 16th Century set many traditions for the modern regiment. Composed of 12 companies of 250 men each, the fighting strength was equally divided between pikemen and arquebusiers.*

First capsule:
The beginnings

The precise size and organization of the squad have long been debated. It seems that in ancient times, initially the smallest tactical element was formed by an arbitrary mathematical division of a larger formation. For example, under the ancient Mongols a *touman* of 10,000 was a division, the decimal system prevailing all the way down to a unit of ten horsemen. This basic small unit, or cavalry squad, was handled as a body. Evidence of this is furnished by the fact that the defection of one or more of the ten-man unit in battle meant trial and execution also for the rest. But it does not appear that this squad had any special tactical significance or independence.

Sometime around 1420, Jan Ziska, the Bohemian general, created a tactical system based upon gunpowder weapons—a system which proved him 200 years ahead of his time. "Throwing all military pedantry to the winds," says Sir John Fortescue, "Ziska fought as his own genius dictated. He was the first to make artillery a maneuverable arm, the first to execute complicated evolutions in the face of the enemy and the first to handle cavalry, infantry, and artillery in efficient tactical combination." In consequence, his infantry "squad" is interesting. A distinguishing feature of the Hussite military system under Ziska was the adoption of the wagon fort as the tactical unit. This was essentially an armored car with loopholes for firing crossbows and handguns. Twenty warriors were attached to each unit, half of them being pikemen who manned the gaps between wagons to defend against cavalry assault. Thus, the infantry portion of the team was made up of a ten-man "squad." Except for the possible influence of the decimal system, there appears to be no evidence as to precisely why this "squad" numbered ten men.

Later, in 1534, the Spanish *tercio,* a tactical unit of about 3,000 infantry, set many traditions for the modern regiment. Composed of 12 companies, each of 250 men, fighting strength was equally divided between pikemen and arquebusiers. Company officers were a captain and an ensign, while a sergeant and ten corporals made up the noncommissioned officer quota. Thus, it would appear that the smallest basic infantry unit was probably about 25 soldiers.

Following the defeat of the Spanish Armada, the Dutch initiated infantry reforms that had two definite aims: im-

proved maneuver in the field, and better siegecraft. To this end they adopted small and supple units as compared with the enemy's larger *tercios*. Companies were cut from 150 to 115, and then to only 80 musketeers and pikemen in equal proportions. The width of the front was increased by reducing the depth of the "shot" to ten ranks and having pikemen stand at three-foot intervals instead of shoulder to shoulder. While no precise mention of squads can be discovered, it appears that the Dutch reforms reduced the size of the smallest basic unit to much lower than 25 soldiers. Apparently the purpose of this reduction was to achieve better maneuverability and flexibility.

On the surface of early military history, there appear no hard and precise reasons for the early shaping of the size of the smallest basic infantry unit. In some instances it seems that a lack of qualified leaders in the ranks, or the absence of a system for training them, led to grouping more soldiers under a single leader than might have been desired. Apparently the degree of intellect, background, and lack of education among the low classes that comprised the majority of infantry ranks was not conducive to creating and developing a large number of small-unit leaders who could be entrusted with more than a margin of authority. Among tactical units—in formation, generally tight and often shoulder-to-shoulder—the lowest basic unit, by itself, did not emerge with any real tactical prominence, apparently because of poor leadership. Weapons influenced tactical formations, and so long as the ranges of weapons remained short, formations remained essentially tight in Europe.

Capsule Two: *Origins of the U. S. squad*

Prior to the Mexican War, the U. S. Army had drill squads, but tactically the squad—or its equivalent—had no great place or prominence. Just before the Civil War there was growing emphasis on the use of segments within a company. This emphasis resulted from the increased lethality of firepower caused by the Minié bullet and the extensive experiments with repeating and breech-loading shoulder arms. To offset this effectiveness in firepower, dispersion was stressed, but this strained the ability of officers to control large bodies of troops. This circumstance dictated the need for smaller elements within units. This meant increased use of platoons (half companies), sections (half platoons), and the beginning of the fighting squad. However, the promise of wide use of platoons, sections, and squads was not fulfilled during the Civil War.

In U. S. military history the earliest suggestion of the squad is a file of two men, "the two being taught to stick together during a fight." Later, for training purposes, squads gradually changed from irregular knots of men (1815), to specified fractions of a company (1841). The latter were to be quartered and trained together. There was no expansion of their use in combat until 1855, when the new manual prescribed "comrades in battle" (two files, totaling four men) who were to work together in battle.

The Army Lineage Book says, "One of the great trends in military organization during the second half of the nineteenth century had to do with organization below company level." Within two years after the Civil War a new manual on infantry tactics was issued. Prepared by Brevet Major General Emory Upton, this manual, *Tactics*, remained official for 24 years. It based all troop evolutions on movements by fours. Since a front of four men in proper line had a rear rank, the basic subdivision of the new system (although not so called) was really a squad.

The *Infantry Drill Regulations* issued in 1891—the first manual to bear that name—defined a squad more sharply than ever before. Since extended order was gradually displacing close order, the squad gained new importance. Available texts do not cite the reason why the squad numbered eight soldiers. There's reason to believe that voice control may have been the significant factor.

During World War I the squad came into its own. Hand and rifle grenades and automatic weapons caused many changes in the organization of companies and their components. During this war the question as to their best placement was never definitely settled. All were included in a rifle company, but sometimes the automatic-rifle men were formed together, as were the grenade throwers and rifle grenadiers; at other times they were scattered among squads. As late as November 1918, in the Meuse-Argonne operation, the specialists stayed together in combat groups, but the trend was toward dispersion so that every squad had at least one automatic rifleman, one good grenade thrower, and one rifle

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FIRST AIR FORCE OPERATIONAL GUIDED MISSILE

During World War I the squad became more important than ever before in history.

The 12-man squad of World War II had to have two noncommissioned leaders.

grenadier. Firepower—or the need for greater automatic firepower—was influencing squad organization.

Whatever the organization, extended order became necessary in combat. Men could not bunch up and live. Therefore, close formations had to break up when they came within artillery range. Approach to the enemy resulted in a progressive extension, and this in turn threw a greater burden on leaders of platoons and squads. Firepower effects as well as demands, plus the need for tactical dispersion, were factors slowly influencing the composition, shape, and size of squads.

World War I had placed one automatic rifleman in the squad. In 1930 one more was provisionally added to the squad but this arrangement did not last long. During the thirties, improved weapons made it possible for fewer men to deliver the same volume of fire. But the peacetime squad remained at eight men.

In 1937 the 2d Infantry Division was formed into a provisional unit to test various proposals, among them organizational ones. From these tests emerged a new set of tables of organization which became effective on 1 January 1939. The new TOE were built on a triangular basis in which, from squads to regiments, elements within an infantry division were grouped by threes.

Developments before and after World War II

The squad was enlarged from eight to 12 men, despite evidence produced in field tests that seven or eight men were all one corporal could hope to control in battle. The Chief of Infantry strongly urged the increase. The command weakness in so large a squad was corrected late in 1940 when the leader was made a sergeant and his assistant a corporal. With two noncommissioned officers in charge, the infantry squad remained at 12 throughout World War II.

As a result of the 1946 Infantry Conference, in 1947 the infantry squad of 12 was reduced to nine. Reports of that conference emphasized these four major considerations:

- CONTROL. The leader's major problem is control. The size of his squad should be limited to the number of men one leader can control with voice and hand signals. One man can control no more than eight others in combat.

- ATTRITION. A rifle squad seldom fights at full TOE strength. A normal fighting strength of 25 per cent less than that authorized must be anticipated.
- FIREPOWER CAPABILITY. Additional automatic weapons (due to decreasing the squad's size but maintaining one BAR per squad) are desirable for increased firepower as ammunition resupply does not seem to be a major problem.
- FIRE AND MANEUVER. A squad seldom employs fire and maneuver within itself in order to advance. A rifle squad of nine men would be employed as a base-of-fire force *or* as a maneuver force, but not as both simultaneously, for two reasons. First, the employment of fire and maneuver requires the use of subordinate leaders, and this would violate the concept of the rifle squad. Secondly, given small initial strength, combat losses would soon render ineffective either the base-of-fire group or the maneuver group, or both.

During the Korea action, the nine-man rifle squad was issued two BARs; employment of the additional automatic weapons was favorably accepted by many combat leaders. The TOE change was made official in 1953 by assigning two BARs and six M1s. Beyond the hard tests of combat the squad subsequently underwent a series of field examinations. Operation Falcon (1953) tested the 11-man squad. The Infantry School did not concur in this size for a squad. Exercise Follow Me (1955) tested a seven-man squad, concluded it was inadequate, and recommended a ten-soldier unit. Exercise Sagebrush (1955) examined the type of squad needed in the atomic field army.

Recommendations of the 3d Infantry Division report on Sagebrush regarding the infantry rifle squad were in effect that the nine-man squad is too large to be coordinated by one leader in combat and too small to be subdivided into the most effective organization of fire teams. It recommended that the 12-man strength be restored so as to allow the squad to be subdivided into three firing teams. One of these would be made up of two BAR men and two riflemen, the assistant squad leader being the fifth man and group leader. The remaining six men would form two three-man maneuver teams, the squad leader being the seventh man to direct the efforts of these two teams, which may operate as a single group or as two groups in coordination with each other and with the base-of-fire teams.

Finally, on 20 December 1956, the rifle squad was increased from nine to 12 men. Today, this squad consists of a squad leader and two five-man fire teams. Each team has a rifle-armed leader, one AR man, and three riflemen.

Modern factors and influences

Primary factors influencing the size and composition of the U. S. infantry squad have been control, attrition, fire capability, and fire-and-maneuver ability. Differences of opinion regarding the value and relationship of these factors have caused fluctuations in the squad's size, organization, and armament. Additionally, there have been—and probably will continue to be—differences as to whether the rifle squad should be designed to have the capability of conducting pre-planned fire and maneuver.

For example, doctrine established during the 1946 Infantry Conference excluded the use of fire and maneuver by the squad as *normal, planned-for* procedure. Today, FM 7-10 doctrine calls for this, and our squad is so organized. Advocates of the use of fire and maneuver within units smaller than the platoon can point out that the increased distances between small units dictated by modern warfare frequently will make it necessary for small units to execute such tactics to carry out their mission. Advocates of the use of pre-planned fire and maneuver only within platoons or larger units can demonstrate that control would break down if a number of small units were to subdivide further into fire-and-maneuver elements.

A resolution of the controversy must take into account these two opposed risks. At the core of the control problem is the factor of communications. If provided effective helmet radios (receiver and transmitter), or a very modernized, workable, and related communications system, the control problem could be eased to where a single leader could much more effectively control a squad and conceivably control more than five to eight men. Increasing the future men-to-leader ratio would appear to rest primarily on improvements in means of communications. Considering the demands of night operations in current and future combat, "improved

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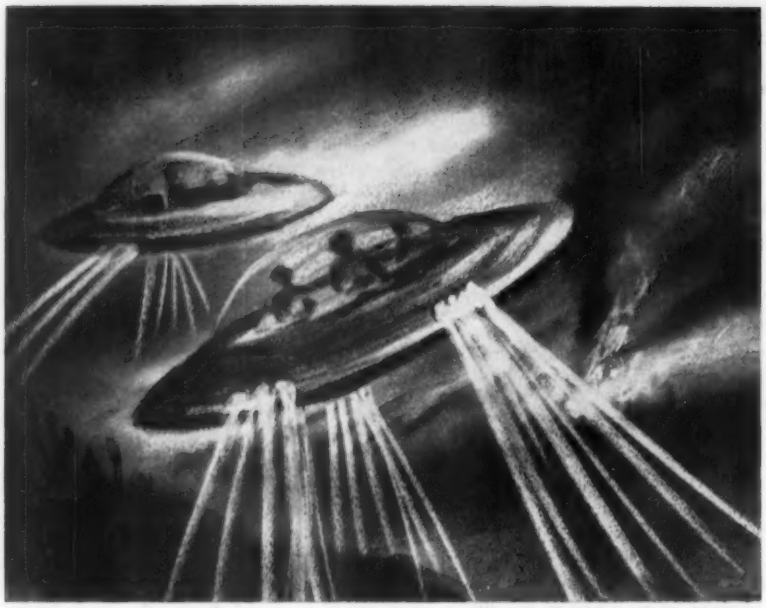
FIRST FULLY OPERATIONAL ELECTRONIC AIR-DEFENSE SYSTEM



Modernly armed with blast type weapons, a three-soldier squad in a flying assault vehicle can become much more effective than any squad of the past providing it possesses good communications.

In the future, the span of control is likely to rest more on night vision devices and individual radio communications between squad leader and members of his unit. Technology can serve to increase the span of control.

communications" between leaders and led should embrace more than just helmet radios since vision will be a primary factor in control.

Conflict over span of control

Before we can have a truly modernized squad the span-of-control argument must be settled. The expression "span of control" is applied to the number of subordinates a leader can supervise effectively. The topic has been the subject of both research and debate. In 1933, V. A. Graicunas, in *Relationship in Organization,* set forth his theory on the "span of attention." He said the amount of attention demanded of a supervisor by his subordinates is in proportion to the number of possible relationships between the leader and his subordinates and among his subordinates. Thus, a leader with four subordinates will have "direct" relationships with each. The Graicunas formula shows a total of 44 relationships where there are four subordinates. Where there are eight, the relationships total 1,080. Thus, according to this theory, the amount of attention required by eight subordinates is 25 times that required by four.

Alvin Brown, in *The Armor of Organization* (1953), attacked this theory. He says: "It is astonishing what notions will sometimes gain uncritical acceptance. Here is a little mathematical razzle-dazzle and the invention of an apt expression . . . as a new dispensation. For it has been accepted by some (including some among the military) whose common sense must have been momentarily suspended. It is not on record . . . that anyone ever seriously applied the theory."

With regard to the span of control, the late Field Marshal Lord Wavell said the number of units in a group should not exceed six. Clausewitz is on record as tolerating eight, and in some circumstances, ten.

While the consensus appears to declare in principle that no commander can effectively direct more than 12 subordinates, military organizational history reveals numerous violations of this principle. These violations relate mainly to very large units, however.

As for the span of control, Alvin Brown's study of organization concludes that "the number of primary delegations should not exceed ten, and should be as near that number as other principles of organization will permit." He admits

this figure will be challenged, and he criticizes military men who "are fond of saying that delegations should be limited to four or five . . . [but] they never put their convictions into practice . . . they follow a rule of 3 or 30—nothing between. They divide their tactical organizations into three parts and their 'administrative' organizations into thirty."

For example, at the time of Pearl Harbor there were 57 commanders identified as under the supervision of the Army's Chief of Staff. The 1942 reorganization reduced this number to about 21. However, by the end of World War II the total had crept up to at least 30. The Commanding General, Army Services Forces, had about 30 subordinates after the 1942 reorganization. The CG, Army Air Forces, had about 46 subordinates to supervise in 1944. The CG, Army Ground Forces, had about 27, but the "armies and other units or forces" were lumped in one box on the organizational chart.

Finally, however, it should be noted that if the much researched span-of-control theory of ten is applied to the squad, then the Mongols had the solution centuries ago in their use of the decimal system to establish a unit of ten horsemen!

What does the future portend?

As they are applied to the fighting squad, some past arguments, concepts, and theories are going to be rendered obsolete by technology. The span of control will probably be one reason. In the past, tactical control and its related command communications problems rested largely on the value and power of a voice against high wind and battle noises. In the future, the span of control is likely to rest more and more on night vision and individual radio communication between the leader and the members of his squad. The leader's ability to recognize common tactical errors will be enhanced when he and his men can communicate well, bridging defilade and darkness. Since all members of the squad can listen in, they will be better informed and better oriented. Plainly, greatly improved means of scientific communications can provide for a span of control greater than the ten or 12 men of the past—perhaps up to 24, provided their training equals the technology that serves them.

Today, advances in firepower occur rapidly. Hand-fired nuclear weapons will be next on the firing line. We cannot presuppose such firepower is going to be in the hands of the majority of our troops. However, certain teams—squad teams—eventually will possess this unusual firepower. Other large weapons will have their place within the fighting squad just as automatic weapons gained acceptance. In the past, increased firepower crept into the squad by slow, evolutionary processes; in the future, increased firepower and improved mobility may come to the squad more quickly.

Significant improvements in mobility lie ahead in such developments as zero ground-pressure vehicles, aerial assault saucers, and eventually perfected VTOL-STOL aircraft that will serve combat units and reconnaissance elements. These are *team*-type, squad-type vehicles of great import and promise. For example, three soldiers in a small flying vehicle and armed with two weapons, HE and AT, plus ultra-modern communications, could do much more than the equivalent of the squad of the past. True, they would form a single package, more vulnerable to single-thrust destruction by a blast-type weapon. This, then, would only magnify the need to multiply their force by two or three and designate this combination a modern, nuclear-age squad.

Given the proper firepower, communications, leadership, and mobility, such a type of modernized squad can achieve in combat all that the platoon has done in the past. For example, a squad of six to 16 men, armed with at least one hand-held, small-yield nuclear weapon, provided air mobility by zero ground-pressure vehicles or transported in armor-protected vehicles, and possessing the most modern communications for bringing down other devastating fires from supporting units, could equal many, many times the combat efficiency of the current squad combination of riflemen and automatic-rifle men. If, by virtue of education and military training, the squad's members acquire a high degree of tactical know-how, then their numbers could be multiplied in effective combat strength to a proportion well beyond that of their Korea predecessors. We all know that the selection of high-caliber personnel and the use of effective training methods exert more influence on unit proficiency than any reasonable modifications in unit TOE.

As for combat-unit organization, we see that historically the classic method of organizing units has been first to establish the strength and organization of the division. Then the squads—at

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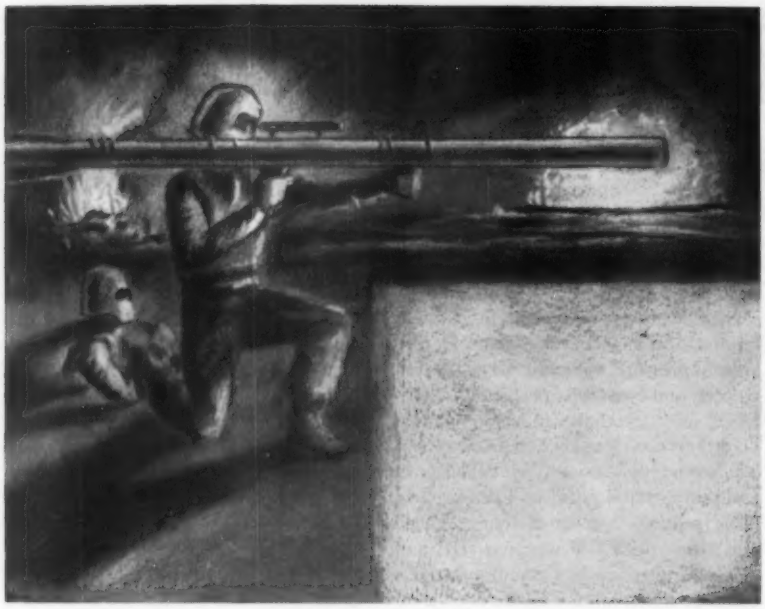
ARMY'S MOST ACCURATE SURFACE-TO-SURFACE MISSILE



A six to sixteen man squad armed with at least one hand-held nuclear weapon could be many times more powerful than the present day squad.

least in part—have become an organizational by-product of the progressive subdivision of the division, regiment, battalion, company, and platoon. For example, it is evident that with the World War II triangular organization of the infantry, reductions and alterations filtered down to become factors partially determining the size of the squad. However, it appears that more recently the classic organizational trend has been reversed somewhat by a new "building block" approach to the formation of units. Under this concept, which begins with the smallest or basic unit, we begin by building upward on combined bricks of combat strengths. The steady growth of firepower available to the soldier would appear to have stimulated this more scientific approach, and called for closer scrutiny of the functional tasks to be performed by the smallest organizational elements.

Potential combat squads of the future

The future functions of the lowest combat elements will tend to remove the rifle symbol from the squad. New and larger weapons will arrive to characterize its main power and probably its title. The squad is destined to take to the air—at least to skim over the earth's surface. Such mobility will enhance its firepower and tactical celerity. But a heavy-duty fighting squad having armored transport will also be necessary—and this type of squad may possess only ground mobility until such time as technology can incorporate all desirable mobility-protective ingredients. For a long time to come, there will be need for two types of combat squads: the light squad that is highly air-mobile, and the heavy squad that is highly protected by armor.

The day is still quite distant, but the era approaches, however, when multiple small units of powerfully armed soldiers can quickly skim or fly in from scattered points to converge upon the results of massive firepower, to exploit its effects with their own high-magnitude weapons, and then disperse to strike elsewhere. Conceivably, at some distant date, such small combat units—then possessing more than the firepower-mobility of present-day companies—could travel virtually in the wake of tactical missiles to arrive with impact and win final military decisions on the ground. As stricken enemy units move and flee, these heavily armed squads will fight and reconnoiter deep inside enemy territory to seek targets of opportunity—or be able to call in and guide in even heavier firepower from supporting units far to our rear.

The fighting squad gained real prominence during the first half of our century. It is due for much greater prominence during the next half.

Why the

A horse-and-buggy-age order of message precedence is senseless in an era of microsecond communications

Lieutenant Colonel
BLAINE O. VOGT

IT isn't surprising that few staff officers and commanders effectively apply the current system of message precedence.

First, there's human nature. Naturally, any message I write is more urgent than any you write because it pertains to my activity; and my business, of course, is more important than yours, his, or theirs.

Secondly, and even more pertinent, it takes a photographic memory and a lawyer's powers of interpretation to fix the various precedence designations and the fine degrees of difference among them. Very few communicators can rattle off the definitions and examples without referring to the book. It's illogical to expect more from originators of messages.

Finally, every time a new weapon system is adopted or an unusual situation develops, nicknames designed to flag and expedite related messages are inevitable. This serves only to compli-

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Flash Is Deferred

cate and further confuse an already overly complex precedence system. The sad truth is that all this jockeying for first priority has been made unnecessary by the high speed and capacity of modern communications.

Our basic message precedence system has six separate classes: Flash, Emergency, Operational Immediate, Priority, Routine, Deferred. To these, add numerous flag-word designations such as Red Line, Blue Streak, Zippo, Express. Multiply these by the number of services and allied commands and nations exchanging messages. Finally, compound them all with additional partitioning as more advanced weapons systems and vital defense plans are developed. In the end, you have misuse of precedence by message originators, and disregard of involved instructions. Often the ironic result is that all messages get what amounts to routine handling by the already harassed communicator who is overwhelmed with competing high priorities. In such circumstances, the Flash stands a real risk of becoming a Deferred message.

The trend towards speed threatens congestion of arteries

The struggle to achieve an ever higher, special prority is comparable to the race in the automobile industry to produce cars with phenomenal horsepower. Because of highway congestion and speed laws, 225-hp steeds straining to go must follow the pace of comparatively low-powered puddle-jumpers. It takes a siren and controlled traffic direction to open a path that will unleash that power. Obviously, if every car were equipped with a siren, traffic engineers would give up, and the resulting congestion would again relegate all traffic to a snail's pace. The fire truck could well be too late to save the burning building.

Just as transportation has advanced to today's power plants on wheels, so has signal communications left behind the semaphore flag and the dot-dash system for automation and near-automation. Now we must adjust our thinking from words per minute to messages per minute.

Our tactical communications systems, even in the smallest units, are immediately responsive to the needs of the commander. We have refinements such as teletypewriters which in conjunction with automatic processing devices increase speed and enhance security. Certain tactical weapons systems and radar warning nets use computer-generated data that are transmitted in briefest form, automatically, and at high speeds. Ship-to-shore and air-to-ground signalling leave little to be desired. Today's field army boasts an area communications system with a flexible grid configuration, connecting highly efficient message and circuit switching centers at link intersections. The trend is toward speed, reliability, and security.

Strategic signal communications systems also have developed to the point where the handling of messages is measured in minutes. Equipment being developed will process average-length messages in seconds—and microsecond timing is not far away.

Today's global teletypewriter networks are made up largely of fully automatic tape-relay centers. Under this concept, even though transmission is limited to conventional teletypewriter speeds (60 to 100 words a minute), the automatic feature reduces processing time to a negligible figure at any given point.

BUILT BY MARTIN

ONLY OPERATIONAL NAVY AIR-TO-SURFACE GUIDED MISSILE

Each military service also operates an Automatic Data Processing System (ADPS) network that transmits computer output between terminals in a fraction of the time it takes to transmit the same message in conventional form. The USAF Combat Logistics Network and the Army Switched Data Transmission Network are the most extensive of these complexes. They employ large switching and relay centers which serve a multitude of addressee terminal stations. The Navy's system, while smaller, is expanding rapidly.

Further, in the foreseeable future, systems will be designed to eliminate the greatest delay factor of all: the administrative bottle necks between message writer and communications center, and between communications center and addressee. The proposed Unicom, for example, will provide customer-to-customer services for all transmission methods (voice, teletypewriter, data, facsimile, and video). Utopian? Absolutely not. Around the corner is more descriptive.

Finally, future advances in signal communications will use earth satellites as relay stations to provide worldwide, instantaneous communications beyond the wildest dreams of pre-Explorer days. The space age will be a boon to the communicator, and we are advancing towards the day of satellite communications.

The current system has outlived its usefulness

What has all this to do with the simple business of message priority? The question should be reversed. The complex system we now use has outlived its usefulness. Actually, it works against attaining maximum benefit from modern—and future ultra-modern—signal communications systems. It inserts an engineering problem into systems design that needlessly increases the complexity and cost of equipment. And when message processing is reduced to seconds (and even microseconds), the subdivision of handling processes into six separate classifications is not only expensive, but serves no useful purpose.

Let's eliminate built-in complexities, thereby reducing the cost of the machine, facilitating the task of the operator, and making things simple for the message originator. There can be no doubt that the current precedence system is archaic and needlessly complex. Surprisingly enough, as I have said, the tendency seems to be toward greater complication rather than toward needed simplification.

In view of the speed and reliability of today's tactical and strategic signal communications, and the known improvements of the immediate future, the six classes of priority should be reduced to two, with one supra-system category. Here is a comparison of the current system with the one I propose:

Current	*Proposed*
Flash	Flash
Emergency Operational Immediate	Operational
Priority Routine	Routine
Deferred	(None)

In my system, Operational and Routine constitute the two basic classes of priority; Flash is the supra-system designation reserved for reports of initial contact with the enemy or emergency operational-combat messages. The definition of Flash remains unchanged, but we would need even more stringent control of its use.

To combine Emergency and Operational Immediate into one classification—Operational—is entirely logical and will eliminate much confusion. It is safe to say that only a small percentage of the readers of this article can cite the difference between Emergency and Operational Immediate. Use of the two has become a matter of preference without substantive reason on the part of originators, and the time difference in handling over high-speed communications networks is infinitesimal. Operational messages should be just that—nothing more. The definition should be simple, direct, and crystal clear.

Non-operational should mean Routine

Under the proposed system, Routine messages consolidate the current Priority and Routine, throwing in Deferred for good measure as a supra-system label, if I may coin a prefix and a term. Again, the speed, capacity, and reliability of military communications obviate the need to recognize degrees of importance or urgency within an administrative classification. Therefore, all non-operational messages should bear a Routine label.

Deferred has a psychologically unhealthy connotation and is eliminated from the proposed system. It was related to the discussion of Routine since it is obvious that some messages should be handled on a deferred basis anyway. For example, a Routine message dispatched at 1600 hours to the Pentagon from Sixth Army Headquarters in San Francisco would be tagged Deferred by the communicator, who should know that the cleaning staff has already taken over in Washington (a difference in time of three hours). Other routine messages for delivery in the Pacific Time zone logically would be processed first, to insure delivery before the end of the normal duty day.

Some diehard is going to point out that while many degrees of precedence now may be unnecessary to the communicator, they still indicate to the addressee the order in which messages should be considered and acted upon. True, provided the originator is thoroughly familiar with all the fine degrees of precedence and makes a calculated, disinterested classification in every instance. The validity of this view also hinges on whether the addressee agrees with the urgency assigned by the originator in comparison with other actions outstanding on the receiving end. The current priority system violates one of the cardinal principles of war: Simplicity.

IT seems we have built up our case to the point where a few conclusions are in order. I think a two-level precedence system would (1) increase communications efficiency; (2) reduce the complexity and cost of signal equipment, particularly as we move progressively into the era of automation; (3) simplify the job of the operator; and (4) provide a workable, effective tool to ensure message writers the greatest benefit from signal services.

Discussion of this subject among military communicators is increasing, especially among the procedures types. More than likely, soon that group will generate a formal proposal for a long-needed change. Human nature being what it is, we can anticipate opposition. If early agreement is to be reached, they will need support not only from their associates, but from their customers as well.

We can hope that, as a logical corollary to any overhaul of the basic priority system, the invention and use of flag names will also be discouraged.

Flash priority should be used in eliminating this costly vestige of the smoke-signal age.

THE MONTH'S CEREBRATIONS

OUR ANTIQUATED INTERIOR GUARD

Procedures have changed little since frontier days

CAPT. HAROLD J. MEYER

I find it difficult to understand why the ancient and outmoded interior guard system is still casually accepted in our modern nuclear army. Its functions are not fresh or current, and consequently interior guard makes little sense to the modern soldier and fails to satisfy the requirement for which it is used. Current interior guard procedures have changed little since the days of the army of the frontier when its small posts lacked internal communications systems and artificial lighting. Then as now, a guard provided security, prevented unauthorized entry and gave the commander a means of enforcing discipline. Through the years experience was gained and eventually the interior guard system was well formalized with its eleven general orders. Its posting and mounting systems were excellent when all guard posts were within voice distance of the guardhouse and today's influences did not exist. These conditions do not prevail today, yet we still carry on our interior security under a set of rules that was suited to conditions at the turn of the century.

Let me show you how obsolete is our internal guard duty system.

You, Private A. Soldier, are the sentinel of Post No. 3. Being the type of soldier who exemplifies alertness and a desire to perform your duty to the utmost of your ability, you thoroughly understand General Order No. 11: "To be especially watchful at night and, during the time for challenging, to challenge all persons on or near my post and to allow no one to pass without proper authority." Bearing this general order in mind—in addition to the other ten plus the special ones—you walk your post in what you think is the finest military manner. Your post around the finance office is an important one. Your movements as a sentinel are sharply done.

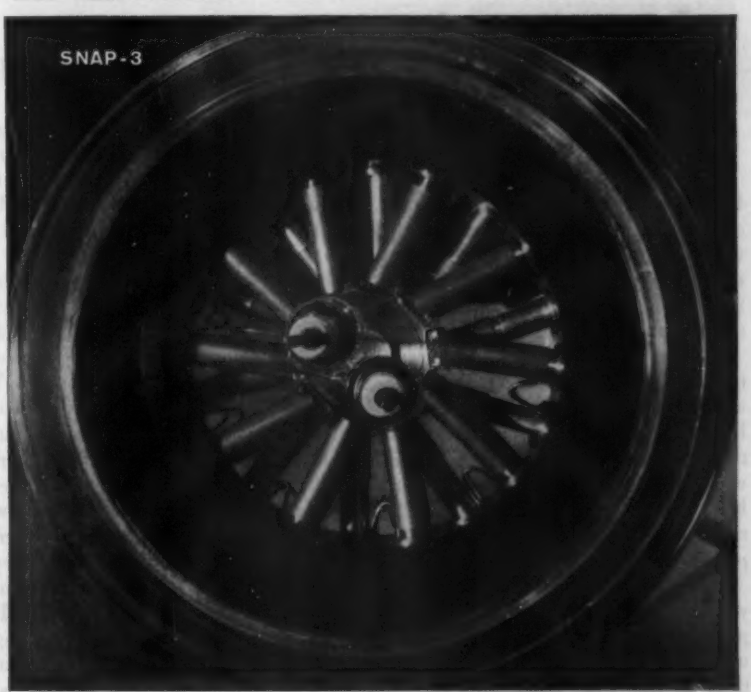
Suddenly you face a situation that causes you to falter. It is one that could be met at most major CONUS installations and at some of our scattered foreign bases. The post theater has ended the evening's second showing and the building is being emptied. All the movie-goers who leave by the main theater's south door empty onto your post.

To challenge or not to challenge? (They are merely using the sidewalk to go to the parking lot, but I am supposed to challenge *all* persons *on* or *near* my post! Here comes Sergeant Jones—my sergeant—and his family. How can I challenge him? To hell with General Order No. 11 at a time like this!)

On your next tour of guard duty you are the sentinel whose duty it is to secure the post ammunition dump. This is well beyond the center of the post. You spot a fire within the limits of the ammunition dump. General Order No. 8 says you are "to give the alarm in case of fire or disorder." So you hurry to the telephone at one corner of your post, remove the handset and listen attentively for the operator's answer. There is none. While you wait and wait, the fire spreads. Still no answer from the operator. Obviously the telephone is dead.

Now you *must* give warning about this fire; if you don't serious damage and possibly injury may result. Go in

BUILT BY MARTIN



FIRST PRACTICAL RADIOISOTOPIC FUELED GENERATOR

and put it out? The gate's locked. Call the commander of the relief because this is a "case not covered by instructions"? He is at the guardhouse, five miles from you and there are no other sentinels between you and him to relay your call. Fire a round of ammunition? You can't, because *special* orders forbid.

Now here is a situation where two of your general orders are nullified. It could arise on any Army post. We need a more contemporary approach because both of these general orders restrict the sentinel's action by their lack of currency and practicability.

Now let's move up the chain of command of interior guard. You are commander of the relief, and are thoroughly familiar with and are capable of giving all pertinent commands necessary for relief posting. Now you know only too well that your study of the manual has in part been wasted, for you will not need to give these commands. It is rare for a new relief to march to distant posts. Nowadays they climb aboard some kind of vehicle and are taken there. They have to be taken because most guard posts are widely separated and do not lend themselves to the obsolete ceremony of posting a relief. Yet you, commander of the relief, must know the formal procedure because at any moment your Officer of the Day might test you.

You may think what I have said is exaggerated and somewhat colored. If you think it over you must admit that conditions at most of our posts for the most part do not lend themselves to our accepted rules of interior guard. Study any one of the general orders and you will discover that it is not in harmony with the current climate of military life. Visit any Army installation during the hours of darkness and you will find guard members violating the general orders because of local conditions and practices. Observe any sentinel and you will see how today's conditions limit his full application of his general orders.

Not only are the sentinel's general orders examples of interior guard shortcomings. Placed in proper perspective the entire system lacks value both from a teaching and a disciplinary standpoint. The artificial aspects of guard duty are demonstrated when we forbid sentinels to carry ammunition, when we drape printed special orders around their necks, when we cause a sentry to present arms when armed with a shotgun, and when we prevent our noncommissioned officers from running the guard in any but a purely mechanical way.

So long as we have an Army scattered in garrisons we will need security measures. The mission of a security force on a modern post differs little from what it was years ago. I do take exception, however, with the way we do the guarding. It is interesting to note that in 57 years we have dropped one general order and made very minor modifications in the others.

We have never hesitated to eliminate those things which study has proved are no longer needed. The mule, the bugle, and the command car are gone. It's time we seriously studied our antiquated interior guard system. In the interest of progress a new system should be devised that will help a garrison commander accomplish his security missions and at the same time contribute to the soldier's philosophy.

Captain Harold J. Meyer, Infantry, *enlisted in 1943, was commissioned in 1945, and served in Europe. He has been an assistant PMST, was with the 1st and 24th Infantry Divisions, and is now on duty with the Weapons Department, USAIS.*

CROSS-TRAINING OF OFFICERS

Exchanges should result in better mutual understanding among all services

COL. JOHN A. GAVIN

The Army, the Navy, and the Air Force all offer opportunities for selected career officers to attend certain advanced schools conducted by one of the other services and later to serve on joint staffs. The advantages inherent in these exchanges are readily apparent.

Another scheme explored by at least two of our service academies has been to send cadets of West Point to Annapolis, there to live for several weeks with their midshipman contemporaries, and vice versa. In this manner, each group has the opportunity to observe the curriculum and characteristics of their opposite numbers.

So we have on the one hand the youth undergoing officer training of a particular service; on the other, the more mature officer learning first-hand the characteristics, procedures, tactics, lingo and planning applicable to another service. I use the term "more mature" advisedly, since the exchange of officer students begins at Leavenworth level. One of the requirements for attendance at CGSC is that an officer must have completed "from 8 to 15 years of promotion list service."

I think a serious void exists in our cross-training and education. What we need is to exchange officers in the platoon and company grades of all services. This can be handled on a TDY basis—say, 60 to 90 days. During their formative stage of development our young lieutenants should rub shoulders with their contemporaries of the other services. By doing this they get to know the demands placed on their counterpart junior officers. To do this, they must be assigned to duty with a unit of a comparable arm or service. It would be best if this were done during periods of scheduled exercises or maneuvers. While on these details exchange officers should principally observe and absorb. This would not preclude their assignment to selected duties commensurate with the training they undergo. Also, a limited exchange would be made to provide attendance at short courses conducted for company officers of another service.

Why this proposal? I'll be frank and say it is aimed primarily at reducing some of the chaff and chatter—and sometimes caustic comments, announced blatantly or by innuendo—by a great many people concerning the officer corps of another service. Although often such remarks are made in what seems a spirit of good fellowship, one cannot help but feel they reflect the speaker's true feelings or opinions. How many times have you heard such expressions as "He's nothing but an airborne chauffeur," or "The Marines send their PIOs on patrols," or "We just can't provide the air support requested," or "Those dogfaces want the moon," and so on. Many such comments come from young offi-

cers, principally because they lack a proper understanding of the other fellow's capabilities and limitations.

Let our armed services give this proposal a try-out and, if it proves worthwhile, go for broke. If such cross-training brings only a better mutual understanding, it will be more than worth the cost. I believe much more benefit will accrue during the rubbing-off process. An officer will get the feel of another service and all it entails, including the plight of dependents, and will compare conditions in that service with those in his own. More significant will be the knowledge gained regarding the roles of all three services in the land-sea-air team.

Such experiences should pay big dividends and clarify, amend, or dispel many preconceived unfavorable impressions. Let's give it a try.

Colonel John A. Gavin, Infantry, *Chief, General Division, Combat Developments Section of CONARC, has served on the staffs of several other high headquarters and of a service school. In Korea he commanded the 31st Infantry.*

LEAVE THE PAINT JOB ALONE

If the Army wanted shiny paint jobs it would issue gloss paint

MAJOR THOMAS W. BOWEN

Each year the Army expends thousands of dollars and man-hours for paint. Each lot is carefully examined for quality by some technical service. It is tailored to meet the fighting man's needs when it leaves the hands of the technical supply troops.

Then each unit commander all the way down to the company gets out his paint paddle and goes to work—10 per cent of this, 40 per cent of that, and 50 per cent of something else are the only things that will do for *his* men's helmet liners. For days prior to the big parade, soldiers must sand and scrape to remove all the heat-resistant, water-repellent, non-reflective, rough-surfaced paint on which the research and development people have worked so long and so hard. Then they must apply the lieutenant's, the captain's or the general's favorite brand. This paint job lasts only until the next parade, the next crisis, or the next commander, as the case may be.

Why spend money at all to put the special finish on the helmet liner if that is not the paint job we want or the one we will keep? We might at least save the expense of that original surfacing job and issue unpainted helmet liners. Then each junior-type helmet designer can have his own paint job put on with the first coat.

If the current surface is what we want on the helmet liner, let's have it as it is. When the time comes to paint, turn in the liners and have the job done by professionals. The money saved from the officers' and men's pockets alone could support the next charity drive instead of being spent for the "necessary," additional non-issue portion of the "special" paint job.

Of course, for real economy in dollars and manpower we could extend our paint drive to vehicles. The dull, lusterless paint on our tanks is really quite good. You can touch it up and the spot-paint won't look blotched. It doesn't show dust or dirt as quickly as more shiny jobs. Furthermore it makes the camouflage job about twice as easy. But this paint doesn't shine, it isn't glossy. For those reasons it isn't too popular.

If the Army wanted shiny paint jobs it would issue gloss paint. Since it doesn't want shiny jobs, let's have the intestinal fortitude to tell the troops to apply the issue paint as prescribed by regulations and end the midnight, ulcer-raising sessions where we try to match Jones's helmet liner only because the Old Man casually remarked, "That's the best color I've seen on a helmet liner in years."

Major Thomas W. Bowen, Armor, *who is currently doing graduate work at Vanderbilt University, wrote "Downgrade Division Staffs" in the December 1959 issue.*

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STRANGERS IN A STRANGE LAND?

Break the language barrier to make better friends

MAJOR L. O. NUTTING

Refresher courses at the schools of two combat arms within the past nine months afforded me some interesting, if unresearched observations. While my unsupported conclusions may appear to lack some validity, the indications warrant at least some comment.

To the more than casual observer it appears that after having been oriented by the Allied liaison sections and assigned to an American counselor-mentor, the Allied student is thrust into an alien society and left to exist pretty much by his own devices.

In reality, this is not so much an indictment of the system as it is of Americans as individuals. It points up some character deficiencies which are national in scope. At the very least, it indicates selfishness, apathy, and poor breeding, and typifies the attitude of "me, my wife, my son and his wife" which permits no entry into what we consider our private domain.

It is true that even in the cases of Allied students who speak English, a language barrier does remain to some extent. It seems we are unwilling to exert any effort beyond the minimum in courteous treatment. This condition appears more general among the junior-officer groups. Fortunate are the people concerned when two or more who speak the same language find themselves in the same class or quarters. When this is not the case, foreign officers become "loners" or seek the association of others in the minority, rather than Americans as hosts. This last condition is quite general, even though the barrier becomes even more critical when English is the common though not native tongue of either party.

Aside from the fact that our casual treatment of our Allies reveals a disturbing rudeness, we suffer a substantial loss by our failure to gain from an interchange of cultural if not professional ideas. It is not possible to measure the effect of our lack of cordiality toward these "strangers in a strange land."

Certainly we are underestimating the lasting value of a fellowship we should extend. Many of these students really have no democratic heritage and, as with their native countries, are only now enjoying a break from foreign rule. This is the first and only opportunity for many to closely associate with what is held up to them as an ideal. A warm, helpful and more interested attitude on our part would do much to crystallize and solidify political concepts only recently adopted and which quite conceivably could operate to our future advantage.

Most of these officers, if not all of them, look to the United States for moral and spiritual as well as political and military leadership. In fairness, we cannot offer the one without proffering the other, lest we create a partial vacuum. Our armed services can better satisfy this obligation than any other agency, for only at home do we afford the observer a complete cross-section view of our great country. It is vital that the impression gained by the Allied student while in our midst accurately reflect the character upon which we pride ourselves as a nation. Let us not seek to outdo what seems to be our impression of certain foreign armies in our aloof relationships with these "outsiders."

Major Lowell O. Nutting, Armor, *who came on active duty from the National Guard in 1950, is Armor advisor with the Washington Army National Guard.*

While the editors cannot speak for all CONUS stations, we have reasons for believing that the conditions decried by Major Nutting do not exist generally. For example, during the Christmas season, Allied students at one large post were included in the holiday events of several groups both at the post and in the neighboring city. To mention a few affairs, Girl Scout Troops, supervised by an enlisted WAC, entertained Allied students at a tea and a demonstration of the Scouts' accomplishments. Forty-eight Allied officers (along with the wives of 13) were Christmas dinner guests at one of the city's churches. The International Club of the local YMCA entertained some 15 to 20 Allied students at a buffet supper. The Lions Club had the ranking Allied student from each country, escorted by a Club member, as its Christmas dinner guest. These events indicate that some of the Army's people, anyway, along with their civilian neighbors, realize the value of close relations with allies.

MOBILE RESUPPLY

Logistic support that can keep pace with the Pentomic field army

Colonel HAROLD E. NELSON

AT 0510 the army logistic operations center (ALOC) representative from the rear area security and damage control center handed the assistant G4 operations officer the nuclear strike plot.

Immediately the red FIREBALL light flashed on over the situation map. As the operations sergeant plotted ground zero and predicted fallout pattern, the information was read aloud.

Almost in unison, ten hot-line telephones to each technical service and to G1 and G5 were lifted as the representatives of the army logistic operations center alerted their respective sections to the strike. The technical services sections in turn passed the information on to the major technical services units.

Meantime, additional information reaching the army logistic operations center indicated the strike was of megaton force and that the predicted fallout pattern threatened one of the army's complexes of technical services depots.

Instantly these actions were taken in the ALOC:

Colonel Harold E. Nelson, Corps of Engineers, a student at the Army War College, was Chief of the Plans and Operations Division of the G4 Section, Headquarters Third Army, when he wrote this article. He has served in four Engineer regiments, in positions from platoon leader to regimental commander, and was road locator on the Alaskan Highway. Other assignments included a tour as instructor in combat engineering at The Infantry School and as Engineer of IX Corps in AFFE.

- Advanced logistical command (ADLOG) convoys approaching the fallout area were re-routed to rendezvous points, there to await further instructions.
- An alternate depot complex area was designated and space allocated each technical service. Each service was requested to dispatch an advanced party to the new area.
- A new approach route to the depot complex was selected and passed to the advanced logistical command.
- An evacuation route from the stricken area to the new depot complex was selected. Technical services chiefs were requested to evacuate units at their own discretion.

These actions were completed by 0600.

At 0620 the plan was briefed over closed circuit television for the army commander, the chief of staff, and interested staff sections.

This sequence became typical in many actions handled by the army logistic operations center as a part of a mobile replenishment concept (MRC) of logistic support of the field army, as played by Third Army in its annual command post exercise, Lucky Delta, held at Fort Gordon, Georgia, in early 1959. This exercise involved some 4,600 players and site support personnel representing and supporting 43 major active and inactive units in Third Army's area.

The army commander, Lieutenant General Clark L. Ruffner, in reviewing other exercises, noted the lack of realistic logistic play and directed that action be taken to insure that tactical play be included in any Third Army exercise only if it could be supported logistically. He directed that when situations arose where current doctrine was not complete, a concept be developed for exercise play to insure conformity with current tactical doctrine. Through frequent

and detailed briefings he provided the necessary guidance and command approval to make the concept a workable exercise device.

Logistics with realism and substance

The mobile replenishment concept is a training device developed by Third Army's G4 and technical services sections to provide realism and substance to logistic play in field exercises. It is designed to inject a tempo of logistic play compatible with the mobile forces' concept of tactical operations.

The mobile replenishment concept includes elements taken from current studies and field practices, including airborne, armor, and naval practices. It combines them, with some original ideas, into a pattern aimed at creating new interest in the dynamic field of army logistics.

The basis of the mobile replenishment concept is shown in Figure 1. This drawing illustrates the relationship between a basic fighting unit (the division) and the next higher headquarters which exercises tactical control and provides administrative support (in this instance an army headquarters). Beyond this is a service support organization, or advanced logistical command, dedicated entirely to service support.

The goal of a fighting unit is victory and survival. This is accomplished within a radius of operations which depends on the unit's self-service capability and its capacity to carry supplies; in other words, a measure of the unit's self-sufficiency. Its mobility beyond this radius of operations depends on adequate and frequent replenishment.

The radius of operations of the next higher headquarters depends upon its ability to determine the requirements of the subordinate unit and to acquire and deliver the needed supplies and services.

From the base of operations forward, we deal in bulk tonnage and highly specialized technical support. However, from army headquarters forward, support must be highly selective as to type, quantity, location, and time of supplies and services required.

Stock levels reduced many days

The mobile replenishment concept provides for the resupply of units along the tactical axis of advance regardless of location of neighboring units, over surface and air routes —from army depot complexes made up of technical services depots—to replenishment areas, or transfer points, located in division and corps areas where supplies are transferred to the using unit. Demands come daily from tactical units over teletype and their commanders also designate the location of replenishment areas. Technical services depot stocks are reduced from ten to five days. A safety factor is built into the system in the form of a cache of supplies called a survival dump. This is placed well forward in each corps area.

Army Logistic Operations Center at work. Most promising mobile shelters are collapsible air-inflated tent-like structures

Pipelines are extended as far forward as possible. From there, forward bulk transportation is used rather than depending entirely on exchange of five-gallon cans.

Instead of evacuating economically repairable vehicles to the rear, they are moved laterally to maintenance holding areas where they are repaired or held until the corps rear boundary advances.

Mass casualties are treated by special medical teams flown into the disaster area.

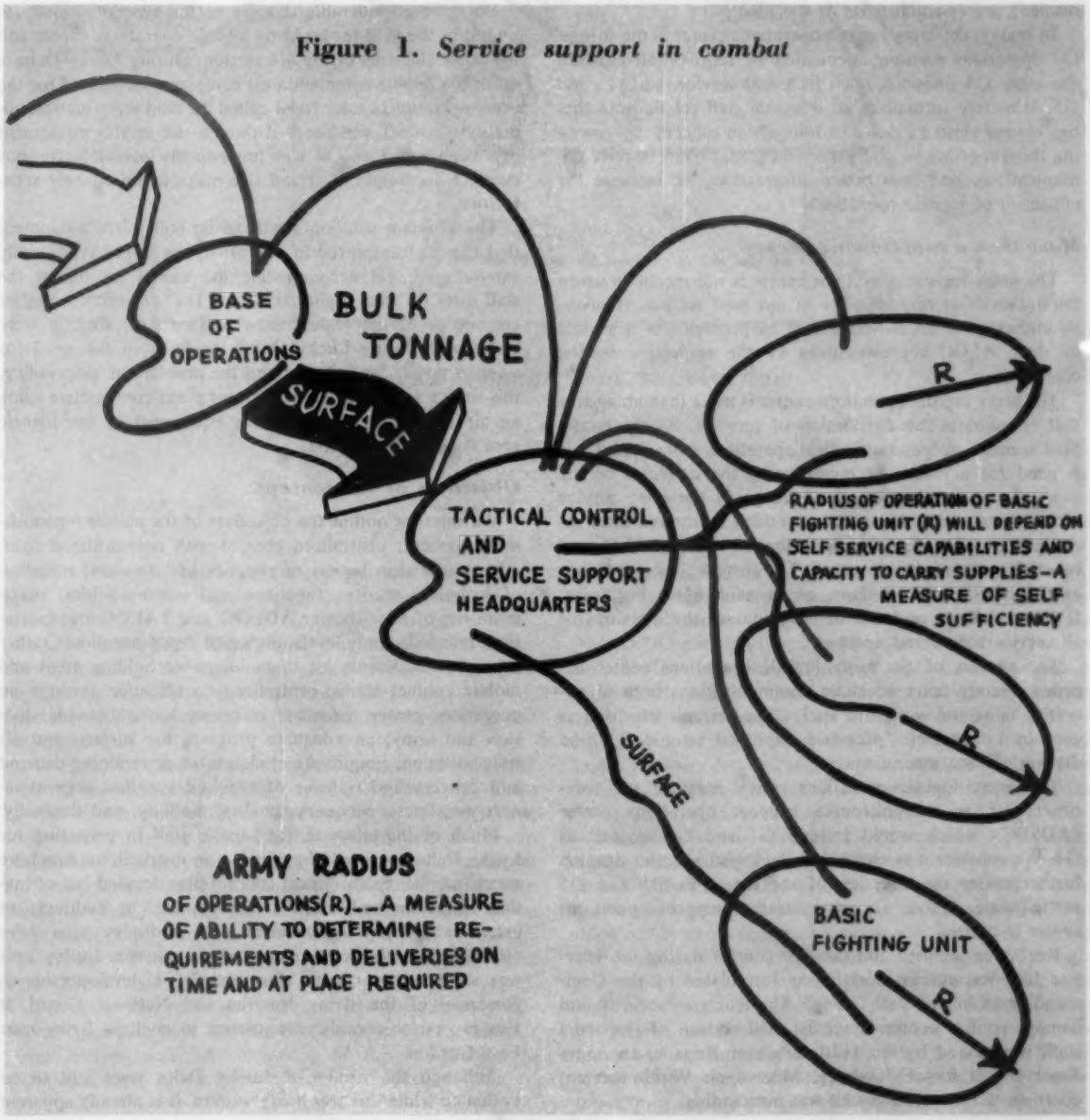
Maximum use is made of support from the advanced logistical command and the theater army logistical command (TALOG) by moving supplies directly to replenishment areas in ADLOG transportation.

The entire operation is coordinated by the army logistic operations center at army main.

The supply plan is the most detailed and in many ways the most important part of the mobile replenishment concept. Figure 2 shows the flow of demand information, or daily teletype, from requesting unit to army logistic operations center, each technical service, and the central stock control point (CSCP). From the central stock control point the information passes by transviewer to each technical services depot and if necessary to advanced logistical command or theater army logistical command. Based on the daily teletypes, army logistic operations center makes up a replenishment directive to coordinate the loading of supplies at rendezvous points for movement forward to the replenishment areas by air or by surface vehicle.

A survival dump contains pre-packaged, essential survival supplies for two divisions for two days. Authority to draw

Figure 1. ***Service support in combat***


BASE OF OPERATIONS
BULK TONNAGE
SURFACE
TACTICAL CONTROL AND SERVICE SUPPORT HEADQUARTERS
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RADIUS OF OPERATION OF BASIC FIGHTING UNIT (R) WILL DEPEND ON SELF SERVICE CAPABILITIES AND CAPACITY TO CARRY SUPPLIES—A MEASURE OF SELF SUFFICIENCY
SURFACE
BASIC FIGHTING UNIT
ARMY RADIUS
OF OPERATIONS(R)—A MEASURE OF ABILITY TO DETERMINE REQUIREMENTS AND DELIVERIES ON TIME AND AT PLACE REQUIRED

from these dumps rests with the corps commander. He in turn must acquire and move them forward as the tactical situation develops and available transportation permits.

Security for replenishment convoys, which move by infiltration, is provided by the rear area security and damage controller.

One half of the divisions and one half of the corps and army troops are replenished on alternate days, each delivery consisting of two days' supply.

Emergency supplies are called Blue Streak Requirements, and go direct to the army logistic operations center when the demand arises.

Infrequently used articles of resupply are stocked and pre-packaged at army and at advanced logistical command for delivery by air on an on-call basis.

Services, like supplies, are brought forward to the tactical units. Direct-support technical services units and Army aircraft (to transport specialists to the area where they are needed) are essential parts of the plan.

In reality, the army logistic operations center is the former G4 operations division augmented by representatives from the other G4 divisions, each technical service, and G1 and G5. It merely formalizes an informal staff relationship that has always existed among various action officers. By grouping them together in one place and giving them better communications, and thus better information, we increase the efficiency of logistic operations.

More than a coordinating agency

The army logistic operations center is not meant to usurp the authority or responsibility of any staff section. Its overall authority to act is determined by prerogatives delegated to their ALOC representatives by the respective section chiefs.

The army logistic operations center is more than an agency that coordinates the distribution of supplies. As the battlefield becomes deeper and tactical operations more fluid, there is need for a means of coordinating the activities of the more than a hundred thousand troops in the army service area and the demands placed upon them by the rear area security controller (RASC), the technical services chiefs, and other elements of the army staff. The army logistic operations center provides this medium, as we said in the beginning. It is also meant to assist in coordinating the activities of all service troops and agencies.

The success of the army logistic operations center depends directly upon adequate communications both to operating units and within the staff. Closed circuit television as used in Lucky Delta promises improved intra-staff action during logistical operations.

The army logistic operations center may be the forerunner of an administrative support operations center (ADSOC) which would include G1 and G5 as well as G4. We consider it essential that the logistics center develop further under the direction of the G4, with G1 and G5 participating, before an administrative support operations center is utilized.

Rear area security and damage control during the exercise followed current doctrine as formulated by the Command and General Staff College. The rear area security and damage control center, a special staff section of the army staff, was played by the 412th Engineer Brigade, an Army Reserve unit from Vicksburg, Mississippi. Within current doctrine, the play of this unit was outstanding.

The mobile replenishment concept recognizes the need for more clear-cut security and damage control doctrine. The responsibilities of the rear area security controller during a security or damage control incident far exceed those normally assigned to a staff section chief. Under current practices, it is possible that units in the rear area might receive instructions simultaneously from several different sources.

The mobile replenishment study indicated that the problem would be solved by using a deputy army commander for administrative support, or an army support commander, either of whom would have command authority over army service area operations, including security and damage control. We further visualize that such a commander would use an army logistic operations center or an administrative support operations center to coordinate rear area affairs. We contemplate using a deputy army commander for administrative support in Third Army's Lucky Echo, to be played in 1960.

We gave considerable thought to the type of shelter required in the field for an army logistic operations center and the other elements of the G4 section. During Lucky Delta a set of the mobile command post equipment developed for the army operations center (now called the field army tactical operations center) was used. Although use of this equipment was economical and it was immediately available for our exercise, its weight, cost and size make it not entirely satisfactory.

The ultimate solution seems to be collapsible equipment that can be transported in aircraft of the C-123 type, easily camouflaged, yet accommodate the varied equipment the staff uses in the logistical area. The air-inflated shelter appears to be the logical answer. Two such shelters were on display during Lucky Delta. Aside from the need for standby power for inflating and the problem of gasproofing, this shelter seems adequate. Current plans contemplate using an air-inflated shelter or similar equipment in the logistic area during Lucky Echo.

Objectives of the concept

We can now outline the objectives of the mobile replenishment concept: centralized control with decentralized operations; unit distribution of supplies and services; retention of technical services functions and responsibilities; maximum use of intra-theater ADLOG and TALOG transportation; reduced supply levels; dispersed depot complexes rather than general depots; use of maintenance holding areas and mobile contact teams; centralized coordination through an operations center; adequate communications between division and army; an adequate program for surface and air transportation; simplified techniques for determining demand and delivery and transfer of required supplies; responsiveness, timeliness, adequacy, quality, mobility, and flexibility.

Much of the effort of the logistic staff in preparing for Lucky Delta consisted of preparing an instructional brochure on the mobile replenishment concept plus detailed indoctrination of active and inactive player units. In addition, an extensive briefing arrangement and a display area were established in the logistic area. Although the display area was set up primarily to show the latest developments to personnel of the Army Reserve and National Guard, it also proved of considerable interest to civilians living near Fort Gordon.

Although the results of Lucky Delta were still to be evaluated while this was being written, it is already apparent

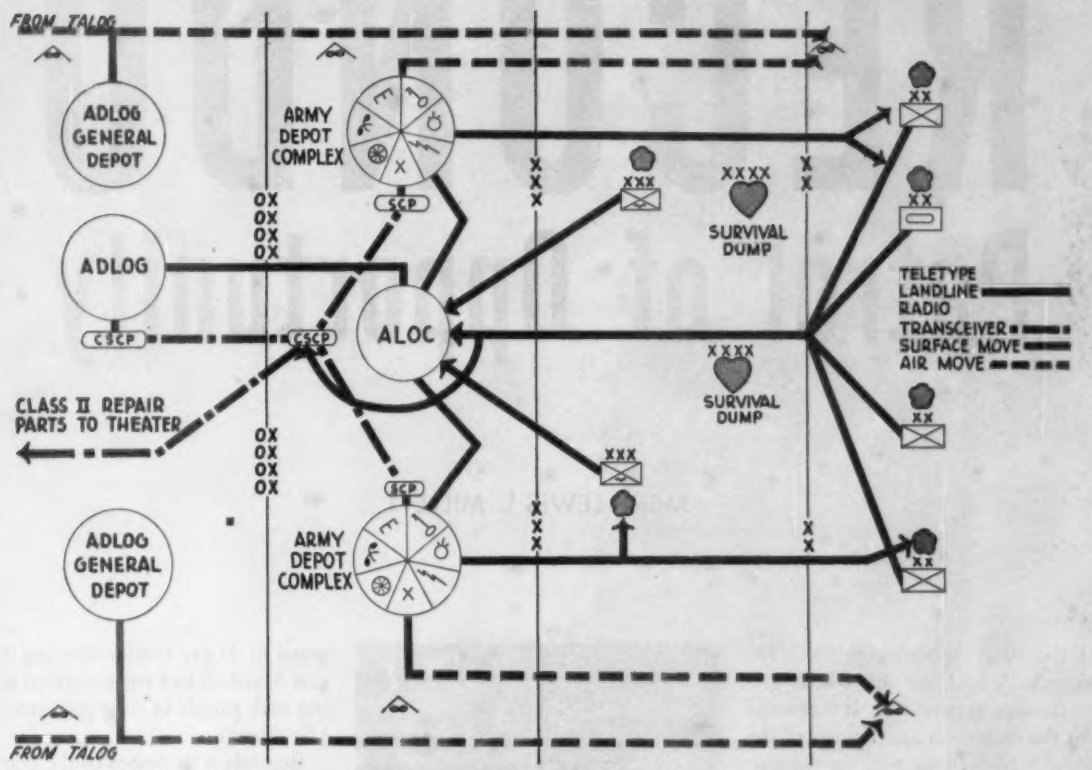


Figure 2. ***Demand and supply flow***

that the mobile replenishment concept provided more logistic play than was experienced in any previous command post exercise held in Third Army. Likewise, for the first time, the army logistic operations center provided a central means of coordinating the many and varied elements of logistic operations. Closed circuit television offers excellent opportunities for improving intra-staff communication in the logistic area.

We need further improvement in the mechanics of applying the mobile replenishment center to exercise play if we are to obtain the maximum benefits. As in all things new, before the full value of the mobile replenishment center can be achieved, many techniques and procedures remain yet to be perfected. During Lucky Delta all staff elements were inclined to rely on the ALOC for information and action that other staff elements were better prepared to handle. This fault will be corrected in future exercises by changing the scenario and control plan.

Much remains to be done toward improving communications—particularly in the transmission of daily requirements over teletype and the conversion of this information to automatic data processing system punch cards or tape, or both.

The small size of the mobile field equipment used by the army logistic operations center resulted in cramped quarters, crowding, and reduced efficiency in some areas. The ALOC proved to be a focal point of observer interest, thus further complicating internal operations. Because of the important instructional value of the center observer, more space must be provided in future exercises.

The concept will achieve even greater value when we can inject a more detailed supply play. For Lucky Echo we are considering a token depot system using transceivers and facsimile supplies with envelope carriers.

Regardless of the need for developing better procedures and techniques, the mobile replenishment concept provides a much needed apparatus to insure that logistical training during field exercises is compatible with the latest tactical doctrine. Since it follows broad general lines and includes maximum flexibility, the concept can readily be adapted to exercises based on any and all types of small- and large-scale warfare. It is designed to take maximum advantage of the new mechanical developments and of the increased airlines of communication. It will work with either the administrative corps or the corps-less army. In short, it offers much promise for future application in field exercises.

RECONDO
Patrol of Opportunity

Major LEWIS L. MILLETT

AT the 101st Airborne Division's Recondo School we are teaching a new concept in patrolling. It is tailored to fit the dispersion and fluidity of the atomic battlefield as well as nuclear-free combat.

The two types of patrol in our current doctrine are the combat patrol and the reconnaissance patrol. A third type which we foresee being added to Army doctrine is the Recondo patrol of opportunity.

Major General W. C. Westmoreland, 101st Airborne Division commander, named this new concept Recondo, and gave the idea wholehearted endorsement. The concept was also examined by Brigadier General S. L. A. Marshall, who became enthusiastic. He recalled that patrols of this type were used during World War II; however, they were really recon patrols or combat patrols which were not supposed to do any trouble-shooting. General Marshall had recommended utilizing such patrols in clearing certain Pacific islands.

Major Lewis L. Millett, Infantry, was commissioned in 1944 after battle service in North Africa, Sicily, and Italy. He was awarded the Medal of Honor for leading Company E, 27th Infantry, in Korea in what has been called "the most vicious and successful" bayonet attack since Cold Harbor.

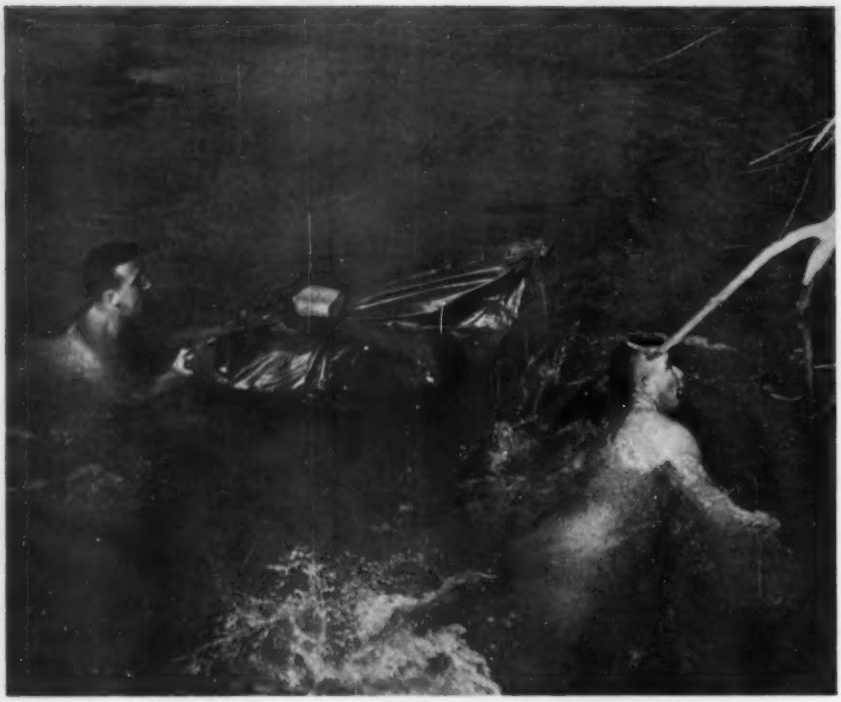
The swing-out across the river pendulum fashion, using a long rope anchored to a tree on the far side

Recondo is dedicated to the domination of certain areas of the battlefield by small, aggressive, roving patrols of opportunity which have not been assigned a definite reconnaissance or combat mission. The leader is free to travel over his assigned area in a "check route," causing as much damage to the enemy as possible. We give our troopers the usual patrol order except that the mission paragraph states: "Execute a Recondo patrol in the area bounded by [so and so], from *X* hours until *X* plus 6 hours." Using their skill under trained patrol leaders, our Recondos go over their areas in a check route which the patrol leader has planned.

When the Recondo leader sights a target he quickly estimates the situation and decides on his course of action, which might range from a reconnaissance or a few rounds of well-placed harassing fire to a full-scale raid.

Why do we need this type of patrol? Among other things, Recondo has the advantage of a fast start and the ability to act as the situation demands, instead of as the mission dictates. The idea of a reconnaissance patrol returning from

Three different hitches are used in repelling, according to the mission and whether the soldier is moving light or loaded. The danger is rope burn more than collision with the cliff

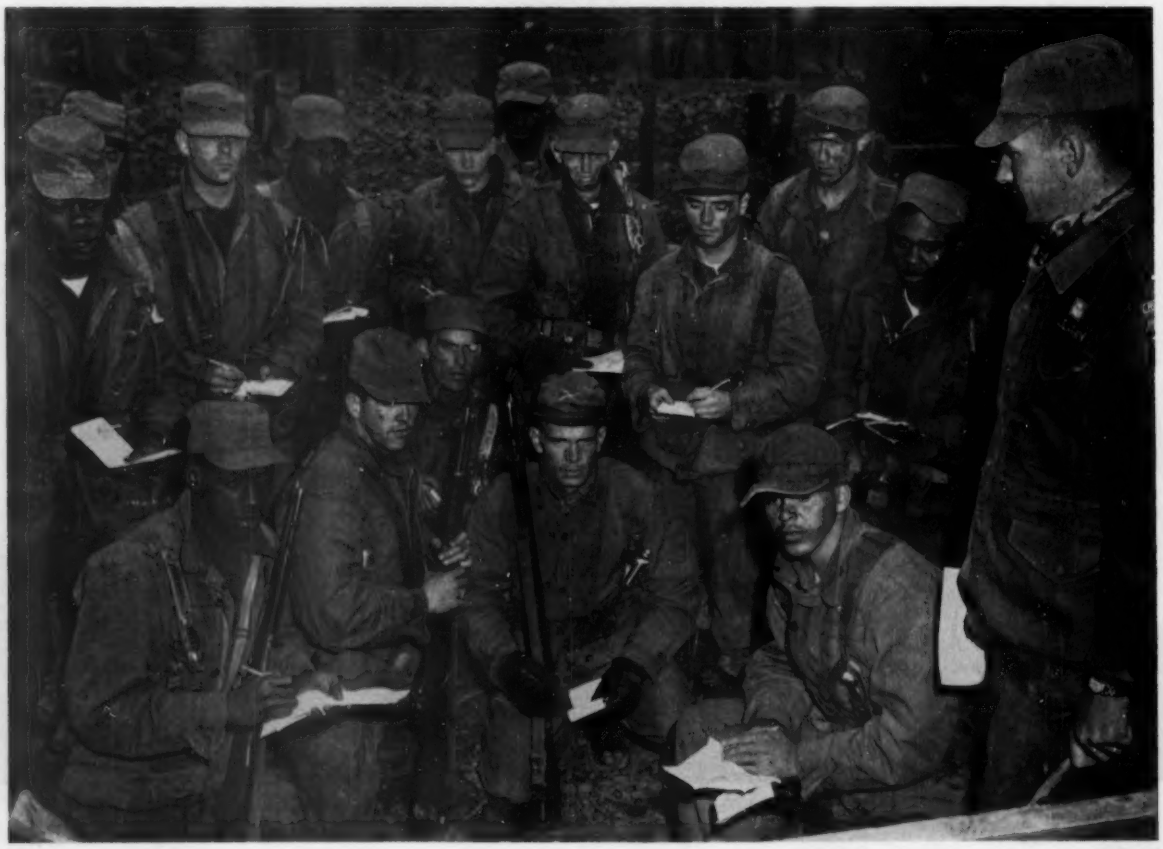


Two soldiers form a raft, using rifles for the frame and ponchos for the cover. Within the raft, all equipment is towed across dry

its mission with the information that an unprotected enemy CP is located behind Hill 609 is ridiculous. If the CP is unprotected, why didn't the patrol destroy it? The target probably will have moved or the situation have changed before G3 can plan a combat patrol to hit it.

Sometimes combat patrols are sent out with a definite mission. On the way, a more valuable target may appear; however, the patrol cannot afford to attack, since that would jeopardize its mission. In the war of the future, we need a more flexible concept, and Recondo gives us that. In the fluid or uncertain situation, the Recondo soldier is in his element. He can act on his own initiative and attack important targets of opportunity, where a more conventional type of

The patrol at its final briefing before starting on a 36-hour grind through swamps and hills



patrol could not be planned until the situation became more clarified. Recondo is not meant to replace the combat and recon patrol, but rather to supplement them where fast action and flexibility are the keynote.

For example, as soon as a unit takes its objective, the troops reorganize. Everyone gets busy digging in, ammunition is distributed, security is established, and other chores done. During this time the enemy is disorganized by his expulsion from the objective. This is the time when a Recondo patrol sent out by the reserve could pursue and raise hell with the enemy, preventing his reorganization and hindering his counterattack.

During defensive phases our actions are somewhat passive. Recondo is an *offensive* concept, and would fill the bill to patrol between our spread-out defensive positions on the modern battlefield, thereby dominating the area instead of passively defending it.

The versatile Recondo patrol can be used to screen the front of a withdrawing company. The enemy, harassed by the offensive-minded Recondos, would never guess that a company was withdrawing behind this patrol.

Recondos get the general patrol order based on the fast-moving situation of the atomic battlefield

Sgt. Felix M. Meza shows the look of the patrol leader just before jump-off

If a battle group is to make an approach march tomorrow, a Recondo patrol with a radio can be sent out *today* to develop the situation in the area of advance. With the Recondo patrol out there, the point of tomorrow's advance will not get the shellacking it would have. If the enemy has set up a rear-slope defense on Hill 502, Recondo can act and let the group know.

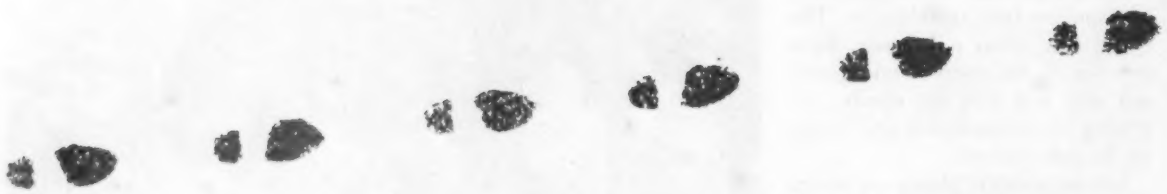
A few small actions, especially at night, can cause a great deal of confusion in rear areas. During a recent division exercise, Eagle Post, 20 of our school trainees jumped into a battle group's airhead on Recondo missions. Sixty per cent of these troopers were captured before they could get free of their chutes. However, the remaining eight caused extensive havoc and confusion by cutting communications lines and sneaking in and destroying command posts and fire direction centers. The Aggressor unit never found out how many Recondos went uncaptured. The sporadic actions here and there caused the number to be greatly overestimated; consequently Aggressor had to commit his reserve unit.

Experienced noncommissioned officers who have planned and led Recondo patrols, which are now part of our training curriculum, agree that this concept fits the American soldier's mentality. The greatest trait of our soldier is his initiative. We know that our soldier can act on his own, and we are basing our training methods on this, our greatest asset. We have found experienced noncommissioned officers very enthusiastic over the Recondo concept. It is something they would volunteer for in combat.

The leader of a Recondo patrol must be skilled in map reading and trained in ranger-type tactics. Ranger schools and others like our Recondo training are turning out this type of soldier.

The spirit of Recondo—the patrol of opportunity—is the same as that which motivated the Minute Man who harassed the enemy from Concord to Boston, and the Indian fighter who beat his opponent at his own game.

The Thirteenth Step



Colonel RUSSELL V. RITCHEY

IN contemplating the almost unbelievable development in the speed, range and destructiveness of modern weapons, we sometimes lose sight of the fact that these developments are based upon some relatively simple truths, existent since man (and we use this in its collective sense) first engaged man in combat:

- If equally armed, the desire through ruse, technique, or tactic to gain an advantage over an enemy.
- To develop a weapon which will give him the advantage by over-reaching his enemy.
- The desire to deliver his weapon rather than thrust it against an antagonist.
- The penalty for too rigid adherence to a traditional weapon or tactic.
- Man's tendency to refuse to rearm in peacetime with new and untried weapons but, instead, to introduce them on a piecemeal basis in wartime while maintaining and using traditional weapons until their effectiveness in combat has been invalidated.
- That man's desire to over-reach and to achieve greater kill per weapon has forced his opponent to increased dispersion, leading to a transition from battlefields within countries to countries within battlefields.
- The refusal to intentionally destroy himself so as to destroy his enemy.

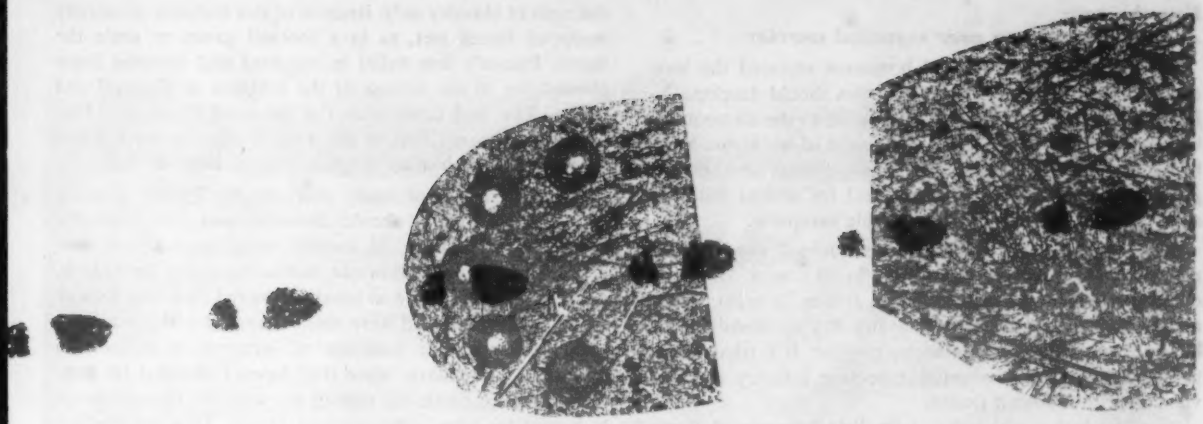
The last factor needs some further explanation. It does not mean the individual men or units who, maintaining perspective in the battlefield environment, deliberately sacrifice themselves for a greater victory but, rather, applies to man as a whole—a nation or a state. To simplify this contention, a man defending his house and family would not destroy his house and family to annihilate his adversary, for his victory would be meaningless. On the other hand, he might do so to save a community, but this is the exception to the rule and would be less likely to occur in a nation. In any case, it seems that to avoid such decision is the fundamental basis for all weapons development, the other factors being subsidiary.

In considering the twelve major steps in weapons development throughout the history of war and in contemplating the prospects of the vital Thirteenth Step to come, we should keep these factors in mind.

Advances in weapons have not always come during easily definable and specific periods but, rather, due to the traditional conservatism of military men, have been used piecemeal by their supporters, thereby sacrificing any advantage their unannounced and massive use on the battlefield might have gained. Nevertheless, the more rapid conversion to a weapon newer and more powerful than one's enemy possesses has served to change the course of history.

I propose to illustrate the 13 Steps in weapons

Colonel Russell V. Ritchey, USAF, Assistant Deputy Chief of Staff, Operations, SHAPE, has also served in the Infantry, Cavalry, and Medical Corps. He was a second lieutenant of Infantry Reserve when he wrote "Active Duty Preference" in the Infantry Journal for November-December 1932.



development toward total war. Each step follows a pattern common to all: man's desire to over-reach his opponent's weapon, thereby bringing about his destruction while striving to insure his own security and survival. This urge contains the seeds of both his destruction and defeat.

First step:
Man against man, unarmed

It is not my purpose to determine why men fight but, rather, to examine under what conditions they will fight and the impact of weapons on war.

Without much doubt, men first fought with their fists. To win, under these conditions, required strength, stamina and skill. Under these conditions, men possessing these attributes could not be defeated by lesser men. Furthermore, combatants suffered considerably in any fist fight or wrestling encounter for they must have accepted punishment to give it. Therefore, it is not surprising that weaker, smaller, and more cunning men sought an advantage by weighting their arm or by somehow lengthening their arm's reach; hence, the word "arm" for weapon.

Second step:
The cutting blade, sword over man

The blade didn't develop overnight, but eventually came into existence through clubs, stone hammers, and other crude hand weapons. The blade, either for cutting or thrusting, reached the peak of its efficiency under the Romans and later the Spanish.

Along with the advent of the offensive "arms," man, at the same time, sought to counter them by defensive measures to avoid their full impact. He did this by hiding behind trees or rocks; later he used sticks, brush and shields made from wood, leather and, finally, metal.

Later he covered his body, his head, arms, chest or legs with defenses against the sword. However, like most defenses, they curtailed mobility and utimately limited the amount of armor a man could wear and still march and fight offensively.

When Tacitus first described the Germans, they were "without helmet or armor, with weak shields of wickerwork, and armed with the javelin." In other words, they were still in a primitive stage of warfare, undisciplined, and unable to fight with shock weapons. It was during this era that the cutting sword built an empire.

In the face of the Roman sword and its dominance for more than 300 years, the barbarian learned much. Adrianople, in A. D. 378, ended the supremacy of the Roman infantryman and his sword.

Third step:
Lance over sword

Adrianople ushered in the mounted warrior. On a fleet horse and lightly armed with the lance, the Frank and German not only brought the shock of his horse against the swordsman, but his lance overreached the sword. Together they spelled the end of the swordsman as a dominant factor in war.

Fourth step:
Armored horseman over mounted warrior

In 814 A. D. the armored horseman replaced the unadorned warrior. It was natural that this should develop. Offensively, the mounted man was superior to the dismounted, because of the speed, weight, and height of his horse. Since hand weapons were equal, the man-and-horse combination gained the advantage, which was held for several centuries against the footman—with one notable exception.

The increasing effectiveness of the mounted warrior naturally led to his presence in numbers in all armies. However, once cavalry became common to all armies, its major weakness readily became apparent. Cavalry was an offensive arm, incapable of taking up a defensive position. If it tried, it had to dismount. If it dismounted it became infantry and was vulnerable to mounted troops.

The next logical step was to take their defense with them; so the horse and rider became armored. The impact of this development became significant at the battle of Tours in A. D. 814, which began the era of the heavily armored knight. This lasted until the battle of Crecy in 1346, where ended forever the dominant role of armored horse cavalry.

Fifth step:
Mounted lance over mounted sword

Between 814 and 1346 A. D., the mounted weapon went through a cycle similar to that which occurred on the ground. The sword, the mace and similar weapons were tried and gradually gave way to the lance as the primary weapon. Properly handled, the lance could disable or unhorse the rider. On the ground the footman could get into the horseman's armor and finish him off.

It was obvious, then, that the speed, shock and armor of the mounted man armed with the over-reaching lance would dominate the battlefield. Actually, the advances of armor on horse and rider for the purpose of creating mobile defense gradually made war so costly that only the wealthy could afford to prosecute it. Warfare, as a result, was taken out of the sphere of the common man, or the mass, and conducted by the wealthy states and their nobility.

It was only natural that by using the horse as a means of mobility, each combatant would attempt to over-reach his opponent by developing the longest, strongest, lightest lance possible. At the same time, he might armor himself sufficiently so as to make injury almost impossible.

As we know, armor reached such a tremendous weight that a knight had to be lifted into the saddle by mechanical means. Once unhorsed, however, he became hopelessly ineffective as a fighter, for he couldn't get on his feet.

Needless to say, the weight of defensive armor contributed to his disappearance from the battlefield.

Sixth step:
Longbow over mounted and armored lance

In this change, we see one of the outstanding examples of traditional beliefs effectively blinding a nation to the power of a new weapon in the hands of a potential enemy. The armored horseman had become a class, a culture and, most certainly, a traditional symbol of power. Therefore, so long as the French chivalry was not challenged to physical combat, it could remain a "symbol."

Furthermore, war was considered solely the privilege of this class which, in effect, said that war in Europe was the right of chivalry only. Because of this tradition identically equipped forces met, as in a football game, to settle the issues. France's firm belief in mounted and armored lance blinded her to the success of the longbow in England and Wales. The end came with the battle of Crecy in 1346. Here more than 1,500 of the French chivalry were killed or wounded against an English loss of only 40 bowmen.

Due to the loss of many chargers, the French wrongly assessed that knights should dismount and give battle on foot. Ten years later, at Poitiers, they again threw their armor against English bowmen, but in this action the French, again dismounted, were so heavily armored that they became quickly exhausted and were easily disposed of by the bowmen. However, the tradition of weapons is difficult to overcome, particularly when they haven't changed for centuries. In such cases, the uses of the weapons become strictly bound by rules, practices and rituals. This possibly accounts for the fact that as late as 1415, at Agincourt, the French were to make a final try to win battles with an obsolete weapon and national tactic.

Seventh step:
Firearm over bow

Acceptance of any new weapon is neither absolute nor readily identified by a specific date. This is true because military forces are ultra-conservative where new and untried weapons are concerned. There are two reasons for this attitude: (1) The reluctance of a military group to give up a weapon in which a national expertise has been developed and in which specific training, tactics and tradition have been firmly entrenched. (2) The danger of accepting wholeheartedly new and untried weapons and tactics, thereby risking national disaster.

History reflects that usually new weapons are first tried on a small scale while being backed up by the currently conventional weapons, as we saw in both World Wars.

Furthermore, often the new weapon is supported by a revolutionary or pioneering group firmly convinced of its effectiveness who take it into battle to prove its value. This practice has usually denied the new weapon the impact it could have produced and, at the same time, accounts for almost simultaneous worldwide development of such weapons. Armies have also been more prone to equip themselves with new types of weapons after a war has started rather than before it commences. The reason is that the opportunity readily exists in time of war to test new weapons.

Major General J. F. C. Fuller, in his *Military History of the Western World*, says that the first mention of gunpowder appeared in one of Bacon's writings in 1249. The early mention of cannon appeared in Arabic dated 1204, and in Europe between 1313 and 1326. However, as is usual with new weapons, either the unreliability or bulkiness of the first firearms made their use so limited that they did not become a decisive factor in war for some time.

The handgun called *hakenbuchse* in Germany, *arquebus* in France, and *caliver* in England was the first true infantry firearm. At first its use was limited, however, by weight, range and the length of time it took to reload. Before it could replace the bow, it had to be easily carried, rapidly reloaded, and over-reach the arrow. Also, it had to be produced in sufficient numbers to adequately arm the foot troops. Firearms, not relying on personal strength, made all men tall and democratized fighting.

REPORT FROM **ARMA**

The Missile Train—Mobile Sunday Punch

In the foreground above is the missile train—a hit-and-run Sunday punch for our modern Army. In event of war, the train could fire a missile with nuclear warhead, move rapidly miles away, then fire other missiles . . . without becoming a vulnerable stationary target itself. The missile train would be an ever-present threat to the enemy's tactical units over a wide area.

For such imaginative projects as the missile train, which combines maximum mobility with maximum firepower, ARMA has developed an equally imaginative universal navigation system. Not only can ARMA systems rapidly locate and aim all types of Army missiles, but they are applicable to all types of land, sea and air operations. To the Army, ARMA offers precise vehicular navigation systems for use in artillery and missile survey, combat vehicles, tanks, and helicopters as well as remote control types for mine detection and atomic blast survey. Precision navigation systems are ARMA's business from ships to ICBM's and—beyond.

ARMA, Garden City, N. Y., a division of American Bosch Arma Corp. . . . the future is our business.

Attention, Engineers: Write to E. C. Lester, Emp. Supv., about career openings in R&D programs.

AMERICAN BOSCH ARMA CORPORATION

Colonel Sir John Smyth wrote to the Privy Council in 1591, "The bow is a simple weapon; firearms are very complicated things which get out of order in many ways—a very heavy weapon and tires out soldiers on the march." The Chevalier Bayard so hated the firearm that musketeers, when captured, were hanged on the spot.

It could be said that almost three hundred years elapsed between the invention of gunpowder and the effective development of the musket, during which time the bow, pike, lance and sword filled in the interval while the musketeer reloaded. The grenade and bayonet were developed during this period for the same purpose. So far, no new weapon alone had ever dominated a battlefield or won a war.

Eighth step:
The field fortification over the firearm

Field fortifications *per se* are not peculiar to this era, for the rapidity of construction and efficiency of the Roman fortified camp are well known to all military scholars. However, the individual earthwork, trench, foxhole, or barrier was more or less a product of this period.

While the bow was deadly against clumsy, slow-moving chivalry, a sturdy buckler, helmet and body armor afforded some protection. The firearm, however, ended this protection.

Since firearms were effective at 60 to 100 yards, it meant that both sides must march to within this range before firing. Because armor was of little use it wasn't worn, and the slaughter was terrible. We have, then, an impasse in which attacker and defender suffered equally appalling losses. This led to the development of a defensive technique which gave greater advantage to the poorly led or the untrained. This further bore out the fact that seldom will man for long accept battle on an equal basis without resorting to some material advantage. In other words, no longer able to carry his defense he builds a stationary one and stays behind it, thereby forcing the offensive to come to him.

History provides countless examples of the futility of open assault against fortified positions, or at least the acceptance of heavy losses to carry such positions. This condition led to the next over-reach.

Ninth step:
Artillery over fortification

The improvement in artillery's range, accuracy and mobility made it readily available to break up fortifications, through which infantry could successfully assault. Its range or over-reach also permitted attack upon enemy positions without subjecting one's own infantry to rifle fire.

At the same time, it introduced man to a new factor in war, a factor which, marching along side by side with the over-reach, has added tremendously to war's destructiveness.

Artillery with its explosive projectile could kill or wound 15 or 50. A crew of three or five could kill scores. One projectile exploding in the impact area could break up platoons. While artillery developed in destructiveness through the years, counterbattery duels became more frequent.

As man's frustration increased because of his inability to easily overcome artillery, he charged the guns with cavalry and infantry at great loss. A weakness in artillery resulted. This weakness was the fact that once men got to the guns, the guns were useless in their own defense.

This resulted in infantry being used to defend the guns, making successful attack on artillery increasingly difficult. This situation was further complicated by the use of earthworks, wire and other types of barricades to defend the guns against charging men. This ultimately led to the development of a weapon which broke the centuries-long dominance of artillery.

Tenth step:
Tank over artillery

World War I brought an answer to artillery: the tank. The invention of the internal-combustion engine opened the way to this armored, mobile, gun platform. Again man could carry his fortification with him. The machine gun, with its rapid fire, and the trench system in defense against it, had led to a stalemate that had to be broken.

The development of the tank from 1916 to 1940 was to advance its armament from machine guns to artillery. Wheeled, unprotected artillery rapidly decreased in importance and mobility, lost with the cavalry, now returned to the battlefield in the guise of the tank. Still, the tank required infantry to protect it and hold the ground it had taken. Significant as was the tank, it still failed to dominate the battlefield alone or win a war. .

As significant as was the development of the tank, another weapon entered the arena in World War I. The airplane was to outpace the tank and become the most significant development since the invention of gunpowder.

Eleventh step:
Aircraft over tank

We now move into the modern period of war where the course of the current weapons has not yet been run. However, the interplay of these weapons when applied to man's past behavior in their acceptance permits some basis for forecast.

To view the impact of aircraft clearly, we must separate it from the so-called atomic bomb, for it was possible for the nuclear weapon to have developed entirely in an army or navy atmosphere, without the aircraft ever having been invented. For example, had nuclear power been developed in the nineteenth century, it would, no doubt, have been adapted to heavy guns.

The aircraft was, at first, viewed in a very limited role, that of scouting and observation. That it later engaged in combat in order to secure information testifies to its effectiveness as a scout.

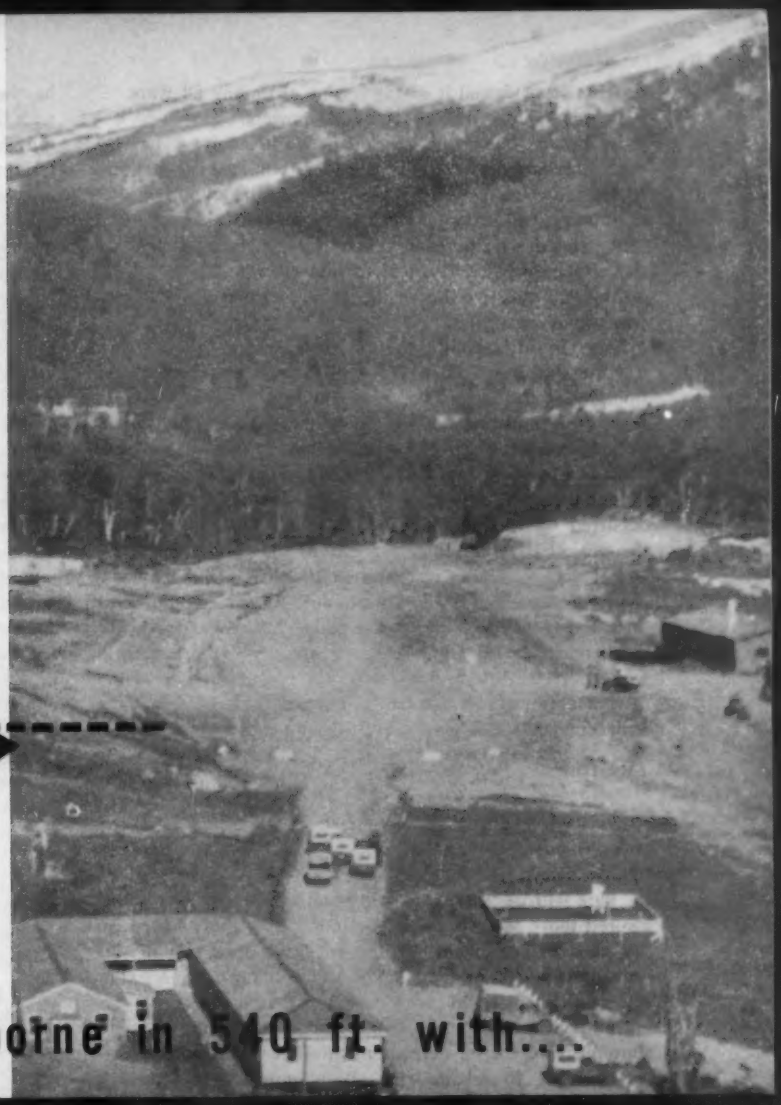
However, as it became more capable, the airplane became a weapon and a part of the old pattern of over-reach. It could carry a larger explosive farther than could artillery; therefore, it filled quite a natural role in war. As we have seen, man will hurl a projectile at his opponent whenever possible. If the opponent can hurl equally well, man has historically closed with his opponent to neutralize his hurling capability.

The aircraft, then, developed as an offensive projector and also as a defense which rose into the air to act as a shield against the attacking projector. Despite its technical and mechanical development, fundamentally it functioned as both arrow and shield in some respects. Later it was developed along separate lines for several separate roles.

Again, despite its effectiveness in delivering a projectile farther, its entry into the panorama of war has followed traditional lines:

- It was not totally accepted by any nation as a sole weapon.
- It did not alone win a war.
- As in any major weapon development, it had its pro-

from strips like this



the S.T.O.L. Caribou is airborne in 540 ft. with....

32 COMBAT TROOPS

or

2 JEEPS

or

3 TONS OF CARGO

The Caribou
Designed and built by
DE HAVILLAND AIRCRAFT OF CANADA
DOWNSVIEW 14th & K STS., N. W., WASHINGTON, D. C. ONTARIO

ponents who viewed it as the means of ending all wars.

▸ It was rapidly developed by all powers.

▸ In a short but critical period in world affairs it has become the primary weapon in at least the greater nations. It now appears, however, that man's desire to hurl, rather than carry, will bring on rapid development of missiles.

A related development which occurred at the peak of the airplane's efficiency, which inferred that it would have a long and effective life as the national weapon and tactic, was the atomic bomb.

The aircraft's ability to transport, probably more than any other factor, did more to influence and restrict the thinking of the average citizen with regard to the development of various types of atomic weapons. The term A-bomb became identified with "airplane" and "airlift." This marriage of the bomb and the carrier might have developed into a long-time national tactic had not another development occurred which further validated man's tendency to send the projectile rather than carry it to the enemy. V-1 and V-2, launched against England in 1944, heralded the most recent application of over-reach and ushered in the next logical step of "sending" rather than "carrying."

There are two possible long-time trends in this regard, as we explore the future, based upon the past: the vulnerability of manned aircraft against unmanned missiles; and the replacement of manned aircraft by unmanned missiles.

Twelfth step:
Missile over aircraft

Let us return for a moment to the airplane over the tank. The airplane could attack and destroy the tank with relative safety to itself. Next, it could take over the role of the tank with rockets, guns and bombs. Its range and speed insured more security to the occupant than that offered by the tank. Development, by the airplane, of the ability to slow down, halt, or land anywhere would have made the role of the tank even more precarious. It is this point we must now consider, as accuracy increases, in the possible supremacy of the air-defense missile over manned aircraft.

According to missile enthusiasts, unmanned craft will eventually drive manned craft from the battlefield just as the arrow stopped the knight. If this comes to pass, efforts to develop an antimissile missile may, at the same time, perfect a highly effective antiaircraft weapon. As some missiles drive aircraft from the air, establishing a highly effective defense, others at the same time take over some of the missions of the weapon driven from the air. These are the IRBM, ICBM, and others.

Thirteenth step:
?

With the advent of the missile and the emphasis on its development, it is reasonable to assume that the era of manned combat aircraft, as we have known it, is drawing to an end until, at least, some entirely new approach to man in the air is developed. As we have seen, Germany's missile without a nuclear warhead and our own nuclear bomb without the missile, gave us this new step.

True to traditional introduction of new weapons, they entered the arena during a war and on a small scale, and neither alone won a war. Historically, as cavalry became a major factor in 378, as the bow did in 1349, so in 1944 the missile became a factor of much future impact on the conduct of war.

Will the era of missiles mean that the ultimate in war has been reached? In the past, when both sides were armed with the same weapons and were of relatively equal strength, they had to resort to tactics and strategy developed through training and leadership. However, with the combination of the missile and the nuclear warhead, can the opponents afford to risk major war with equal weapons, leaving the outcome to the best leaders and practitioners of the art of war?

This is certainly open to question if we accept the examples of the past as indicating future performance. Since man does not take the offensive if he feels he will lose, we can assume that the IRBM and the ICBM with their nation-destroying capabilities, will deter either side from launching an attack, *until the aggressor believes that he can win by some other means.*

Therefore, this Thirteenth Step is a vital one. What the next weapon will be, no one can say.

However, in the light of our factors, it is reasonable to assume that the pattern will again emerge, and, in so doing, that man will again "go to his opponent." If so, it is equally logical, in the light of history, that he will go by air. This contention is supported by the fact that when it has become necessary, man has closed with his opponent with the best means possible—foot, horse, tank and airplane. As the battlefield grows wider, the greater will be the demand for a rapid means of closing. The Thirteenth Step might well be a versatile man-carrying missile whose occupants, armed with small but highly effective and destructive weapons, can meet and offset its long-range unmanned counterpart.

In summary, we will do well to judge man by man's past performance. His inclination and behavior with respect to war is illuminating and worthy of study. For example, his efforts to over-reach his opponent indicate his reluctance to fight on equal terms when it can be avoided; his unwillingness to live under a stalemate in weapons; his defeat when relying wholly on old and outmoded weapons; his refusal to devote all his strength to new and untried weapons; and, last but not least, his tendency to hurl a missile at his enemy rather than carry it.

However, in every instance where a stalemate develops between missile hurlers, where both have suffered heavy losses, man has, in desperation, closed with his opponent. To break the legion's line and to get inside it was next to defeating it. The Spanish destroyed the Swiss pikeman by devising a means of getting under the pikes and to the pikemen. More recently, the main mission of the British Army after the Normandy landings was to capture the German missile bases. Once the men operating these bases were driven off, killed or captured, the missiles stopped hitting England. It was the men, not the missiles, who had to be stopped, and therein may be the clue to "the word" and the Thirteenth Step. Missiles, like artillery or pikes, are no good once the enemy gets "inside" their defense. It is not essentially control of the land, sea or air that is our fundamental problem, but rather the control of man on land, on sea, and in the air.

Despite our rapid development of missiles of longer and longer range, or of weapons of greater and greater power, we in the armed forces must never lose sight of the lessons taught by history and the basic truth, that although each age may have achieved its ultimate weapon, the factors we have outlined have always rendered it obsolete. To our age the Thirteenth Step, then, is an important one.

Let's hope we will be the ones who take that step.

Biggest thirst in the universe

Each 6,000,000 pound thrust rocket ship now being planned for manned interplanetary exploration will gulp as much propellant as the entire capacity of a 170 passenger DC-8 Jetliner in less than 4 seconds! It will consume 1,140 tons in the rocket's approximately 2 minutes of burning time. Required to carry this vast quantity of propellant will be tanks tall as 8 story buildings, strong enough to withstand tremendous G forces, yet of minimum weight. Douglas is especially qualified to build giant-sized space ships of this type because of familiarity with every structural and environmental problem involved. This has been gained through 18 years of experience in producing missile and space systems.

Dr. Henry Ponsford, Chief, Structures Section, discusses valve and fuel flow requirements for space vehicles with Donald W. Douglas, Jr., President of DOUGLAS

MISSILE AND SPACE SYSTEMS ■ MILITARY AIRCRAFT ■ DC-8 JETLINERS ■ CARGO TRANSPORTS ■ AIRCOMB ■ GROUND SUPPORT EQUIPMENT

THE SECRETARY OF DEFENSE HAS PUT YOU ON NOTICE: IF YOU HAVE STARS IN YOUR EYES YOU'D BETTER PREPARE FOR THE FACT THAT

Joint Duty Is Different

Major JOSEPH E. McCARTHY

IF you are not now a general officer but aspire to be one some day, you should read a very interesting directive published recently by Secretary of Defense Thomas S. Gates.* The prerequisites for selection to general officer are not spelled out for all applicants, but this particular paper is unmistakably clear about one requirement. Hereafter, except for a very few categories, all officers nominated for promotion to brigadier general must have completed successfully a normal tour on a joint, combined, allied or OSD staff.

Such an order placing the greatest emphasis on "joint" staff duty has had the expected impact. A colonel who has not had such duty now is faced with the problem of either getting a qualifying assignment or resigning himself to retirement in his present grade.

Even officers who may not aspire to be generals can be affected. Department of the Army Circular 614-10 (19 October 1959) makes this statement concerning selections to "joint" staffs: "The selection of officers to these higher staffs is made with great care and deliberate consideration of the officers' potential for selection to general officer rank." All officers with outstanding records, then, can expect to be considered for assignment to a joint or combined staff some time during their careers.

What staff assignments meet these criteria for qualification? Here are several which were either listed in Secretary Gates's memorandum or can be fairly inferred from it: Office of the Secretary of Defense; Office of the Joint Chiefs of Staff; NATO; United Nations Command; Unified Commands; and MAAGs having substantial joint, combined or allied activity. There are others. In fact, the Department of the Army's list of joint assignments is being revised to specify which of these will qualify officers under the new ruling.

Another question is likely to come up in any discussion of the new directive: What is there about joint staff duty which makes it different from ordinary service staff assignments? Let us attempt to answer this question, and at the same time describe the characteristics of some joint staff duty which may be of interest.

Perhaps the most apparent characteristic of joint staff duty is the association with officers of the other services. This in itself is a broadening experience, because of the variety of viewpoints encountered. Within the space of a very short time on a joint staff it will become apparent to the newly assigned Army officer that each service is a mold which shapes its officers to a pattern. Certainly there are variations, but service customs, traditions, training, regulations, and duty assignments do have an effect. Most officers assigned to a joint staff are experienced and have a number of years of duty with their own services. They are products of their services. For example, an Army officer assigned to a joint staff may be impressed with the spit and polish of marines, with the high esprit of air officers, and with the formal courtesy of naval officers. He may, in time, discover differences between categories within a service. An aviator from the naval air arm typically may be less formal and less inclined to deal with the details of a problem, than a naval officer of the line. Likewise, the typical Air Force pilot may appear to favor tactical and operational matters, in contrast to the non-rated Air Force officer who may seem to stress the importance of his specialty in the logistics, administrative, or technical field.

Very likely your boss will be from another service, so knowledge of these service characteristics could be im-

*Memorandum, subject: *Assignment to Duty with Joint, Combined, Allied and Office of the Secretary of Defense Staffs* (DoD Directive 1320.5, 2 December 1959).

Major Joseph E. McCarthy, Infantry, a 1945 graduate of West Point, after a tour with MAAG, Vietnam, is presently on duty in the Office of the Joint Chiefs of Staff.

all sorts of things and weather

"But all sorts of things and weather must be taken in together, to make up a year and a sphere," said the squirrel to the mountain in Ralph Waldo Emerson's famous rhymed fable. The rodent spoke better than he knew, as *tech/ops* knows after undertaking *Project 433L* (as a member of the United Aircraft team) for the Air Force, the FAA, and the Weather Bureau.

*Project 433L** is aimed at development of semi-automatic weather observing and forecasting, to provide rapid and accurate weather information for military and civilian users. The system will use data processing techniques to provide the almost-instantaneous national and global weather information that will be required in the future. To this end, *tech/ops* is developing automatic programming techniques, systems analyses of alternative future networks, evaluation criteria, digital simulations, and other basic approaches.

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portant to you. A naval officer may be accustomed to a great deal more centralization of authority and control than is usual in the Army. Your naval officer boss may therefore appear to you to exercise too much supervision.

On a combined staff one would expect some language difficulty, but don't be surprised if you find a language problem on a joint staff, too. Don't expect the "deck" ultimately to become the floor, nor the "ladder" to revert to the more familiar stairs. It follows, then, that important words—operations terms, logistics nomenclature, and such—may sometimes, if not frequently, be misconstrued. In 1959 the Office of the Joint Chiefs of Staff published a pamphlet, *Dictionary of United States Military Terms for Joint Usage*. This book is a must for the joint staff officer. Military terms used in one service may have a slightly different meaning in another. The joint staff officer must be certain to use joint terms and with the meanings in mind prescribed for joint usage.

Staff procedures vary among the services. On a joint or combined staff they are a compromise of several systems. The newcomer on the joint staff will be in a world of new forms, unfamiliar memoranda, and strange briefing procedures. Part of the value of joint staff duty is in this meeting with something new. One finds that there is another way to do it. It isn't so much that a "different" way is a better way, but there are some good features in the staff procedures of each service. The new officer on the staff must never criticize the system in use. Rather, he should learn the prescribed policies and administrative procedures and follow them.

Opportunities are not abundant for assignment to joint or combined staff billets. On the higher staffs the opportunities are open primarily to full colonels and very senior lieutenant colonels. For example, in the Office of the Joint Chiefs of Staff there are now only about a dozen Army majors and 40 lieutenant colonels. The normal tour of duty is two years, so it is apparent that few billets for junior field grades are open each year. Company grade positions are even scarcer.

In the unified commands the tour may be longer and there are more openings for junior officers. For example, the USEUCOM staff, near Paris, has some 55 majors and lieutenant colonels and about 10 company grade officers. Even these do not represent a large number of positions when you consider that the normal tour there is for three years.

Because of the relatively small number of positions on joint staffs, it is very likely that Army officers normally will not be given more than one such assignment. It is wise, therefore, for the officer once assigned to learn all he can from the experience. The Army has the wise policy of detailing only its best officers to such assignments. These officers truly represent the U. S. Army in the eyes of the other services, other federal agencies, and allied nations' staffs. A mediocre army officer assigned to a joint or combined staff would offer an example in reverse public relations.

The good joint staff officer is well grounded in the professional matters of his own service, and can maintain an impartial and objective view in dealing with multi-service problems. He must master the staff procedures of his own service before tackling the more complex chores of the joint staff. It will be expected that he can write a staff study. In fact, to a great extent, his general writing and speaking ability will determine his success on a joint staff. His workaday life will be one of analyzing problems, doing research, coordinating on the joint staff level and with the four services, participating in conferences, and conducting briefings. Through it all, a good sense of humor will be a big help. It is a fact of life that service views sometimes clash. The joint staff officer keeps his good humor and an open mind, and tries to treat the problem objectively.

Finally, it is possible to say that joint staff or combined staff duty is a must for almost all career officers. By policy, only Army officers with general officer potential are selected for this duty. The officers selected meet a challenge, because joint staff duty requires, besides an open mind and a sense of humor, adaptability and objectivity not demanded in the same degree in uniservice staff work. It demands of the officer a broad knowledge of the Army, far exceeding his branch or specialty area. It demands that he know the capabilities and limitations of his service, and that he fully represent the Army in joint matters. The successful joint staff officer is one who places loyalty to his country above loyalty to his service.

WHAT IS A STAFF OFFICER?

UNRESPONSIVE, INHUMAN, NON-REPRODUCTIVE

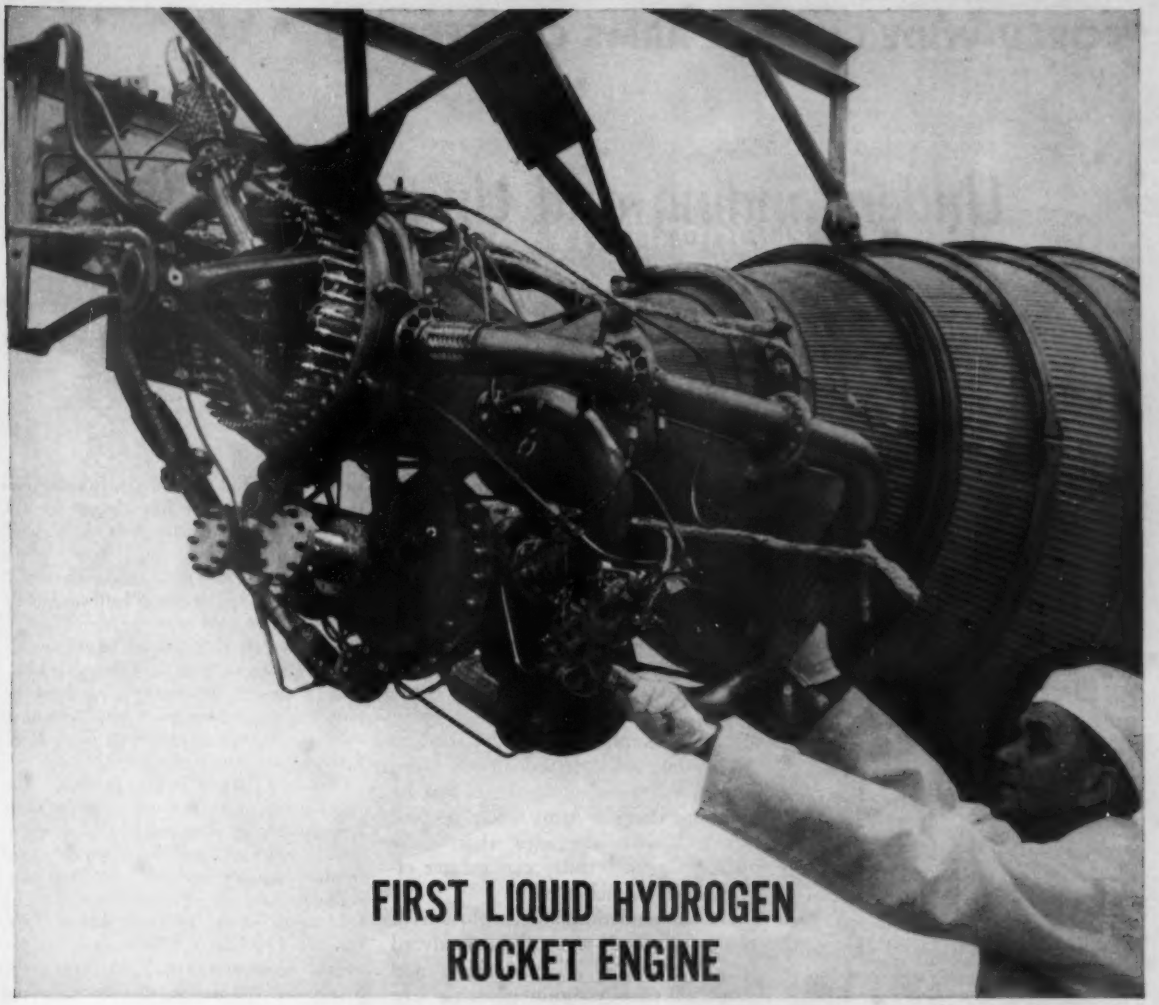
The typical staff officer is a man past middle life, spare, wrinkled, intelligent, cold, passive, noncommittal; with eyes like a codfish, polite in contact, but at the same time unresponsive, cool, calm, and as damnably composed as a concrete post or a plaster-of-paris cast; a human petrification with a heart of feldspar and without charm or the friendly germ; minus bowels, passions or a sense of humor. Happily they never reproduce and all of them finally go to hell.

Attributed to Anonymous by
MAJ. ORVILLE SHIREY,
Infantry Journal, July 1947

SHUN THE INDUSTRIOUSLY STUPID

I divide my officers into four classes as follows: the clever, the industrious, the lazy, and the stupid. Each officer always possesses two of these qualities. Those who are clever and industrious I appoint to the General Staff. Use can under certain circumstances be made of those who are stupid and lazy. The man who is clever and lazy qualifies for the highest leadership posts. He has the requisite nerves and the mental clarity for difficult decisions. But whoever is stupid and industrious must be got rid of, for he is too dangerous.

GENERAL FREIHERR VON
HAMMERSTEIN-EQUORD,
German Army.



FIRST LIQUID HYDROGEN ROCKET ENGINE

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The first of a new family of liquid hydrogen rocket engines for missiles and space vehicles has recently been demonstrated at Pratt & Whitney Aircraft's Florida Research and Development Center. The engine developed 15,000 pounds of thrust under simulated space conditions, and produced 30% higher specific impulse than conventional LOX-kerosene engines. The successful development of this engine opened the way for immediate development of hydrogen engines offering far larger size and power.

The new Pratt & Whitney Aircraft engine has been chosen to power the *Centaur* space vehicle atop a modified *Atlas* missile. It will also power an upper stage of *Saturn*, the booster that will be used to place 35,000-pound satellites in orbit 300 miles above the earth or send a 12,000-pound space probe to another planet. Current developments indicate liquid hydrogen, substituted for LOX-kerosene stages, can multiply payload as much as 3½ times.

A new pumping system — termed "bootstrap" pumping — eliminates the need for an auxiliary gas generator. Pumping power is provided by the expansion of the hydrogen itself.

Pioneering work in liquid hydrogen has been in progress at Pratt & Whitney Aircraft since 1955.

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Understanding and Unity Stressed; Ten Committees Make Reports

IN closing USCONARC's five-day World-Wide Combat Arms Conference at Fort Sill, General Bruce C. Clarke suggested that the spirit of the Conference had been one of "understanding"—of striving to grasp the points of view and problems of the other fellow, of other services, of CONUS, of overseas commands. Certainly every point of view had a chance to sound off during the conference and all got a fair and sympathetic hearing, even the embattled few who felt their positions or their problems were not wholly understood by the majority.

On reflection one thought comes out strongly and that is that decisions—and hard decisions some of them will be—must be made on most of the problems considered during the conference. These are decisions about Army organization for combat, weapons, tactics, mobility, fire support techniques, and arms integration.

A conference of 300 persons cannot, of course, make decisions. Nor can a committee of 12 to 15 persons. But such groups, when knowledgeable as these were, can, through the friction of discussion, stir up the issues and erupt with ideas and possible solutions that can be profitably considered by the decision makers. That General Clarke appreciated this is apparent in his statement that he was "confident that many of these recommendations will reach mature and useful fruition." They would, he said, receive careful attention at his headquarters.

More than 90 general officers and some 200 field-grade officers were official "delegates" at the conference. The formal roster showed also that one vice admiral, one Air Force four-star general, four retired Army generals, one warrant officer and one civilian were in attendance.

At the banquet on the night preceding adjournment, Secretary of the Army Brucker stressed unity and teamwork. He had, he said, been troubled through all his years of association with the Army by the spectacle of the arms and services, that work so closely together in time of war, being the "greatest of rivals in peacetime." He had no desire, he said, to eliminate the arms and services and components but he did hope that the Army would become inspired with the idea that "only through greater unity can greater effectiveness be achieved."

Recommendations and conclusions of the ten committees will be analyzed by USCONARC. The subject and scope of each committee assignment follows:

No. 1. ORGANIZATION. Review and evaluation of operational and organizational concepts with emphasis on the 1965-70 period. *Brig. Gen. M. O. Perry,* Chairman.

No. 2. MOBILITY. Examination of ground and air mobility requirements for the combat arms in the 1960-70 period to include capabilities to cross rivers, mine fields, blowdown, contaminated areas, and other obstacles. *Maj. Gen. R. W. Curtis,* Chairman.

No. 3. AIR SPACE UTILIZATION. Analysis of U. S. Army doctrine, procedures and matériel for regulation of the air space over the field army area for the 1960-70 period. Recommend doctrine and procedures compatible with equipment availability. *Maj. Gen. R. C. Cooper,* Chairman.

No. 4. FIRE SUPPORT AND FIRE SUPPORT COORDINATION. Examination of nuclear and non-nuclear fire support requirements of the ground-gaining arms for the 1960-70 period. Analyze combat arms organization and tactics for employing fire support. Examine concepts for coordination of fire and maneuver. Recommend measures to improve fire support for the combat arms team. *Maj. Gen. L. S. Griffing,* Chairman.

No. 5. AIR DEFENSE. Examination of hostile air and short-range ballistic missile threat to the field army in the 1960-70 period. Consideration of air-defense weapons and fire distribution systems. Evaluation of air-defense concepts of organization, tactics, and weapons employment to meet the hostile threat. *Brig. Gen. J. A. Seitz,* Chairman.

No. 6. COMBAT INTELLIGENCE, SURVEILLANCE AND TARGET ACQUISITION. Examination of organizational and operational concepts and requirements for combat support including combat surveillance and target acquisition for the field army in the 1960-70 period. *Brig. Gen. R. H. Adams,* Chairman.

No. 7. DIVISIONAL ADMINISTRATIVE SUPPORT. Evaluation of organizational concepts for division administrative support to include the division support group concept. Make appropriate recommendations for improvement. *Brig. Gen. C. J. Timmes,* Chairman.

No. 8. RESPONSIVENESS OF DOCTRINE TO FIELD REQUIREMENTS. Examination of current methods of development and testing doctrine to include responsibilities of USCONARC field agencies. Recommend means to increase responsiveness of doctrine to field requirements and experience. *Maj. Gen. N. A. Costello,* Chairman.

No. 9. COMMUNICATIONS. Examination of communication-electronic capabilities requirements for the 1960-70 period. Recommend measures for improvement. *Brig. Gen. C. W. Abrams, Jr.,* Chairman.

No. 10. INTEGRATION OF COMBAT ARMS. To consider measures to effect closer coordination between the combat arms, eliminate branch consciousness, train and provide effective leadership for combined-arms operations. Recommend measures to accomplish above. *Maj. Gen. H. K. Johnson,* Chairman.

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Irons in the Fire

Home in the Foam

The Army Quartermaster Corps is now exploring the feasibility of plastic foam tents for troops. A recent test of these shelters took place in the Alexandria, Va., laboratories of Atlantic Research Corp. where a self-rising plastic foam mixture was sprayed over an inflated canvas dome. The mixture hardened in less than an hour. When the canvas dome was deflated and withdrawn, in its place was a weather-proof shelter six feet tall, 12 feet in diameter, and weighing less than 200 pounds. Foam from which the structure was made was mixed on the spot, foamed in place on contact with the canvas, and expanded outward like a cake rising in an oven. The 1.5-inch thickness of the foam was easily cut with a bayonet, indicating that apertures of any desired size can be cut out as required. Density and thickness of these shelters can be predetermined. The process may ultimately enable one soldier to carry in two small containers the tentage requirements of 10 men. The two chemical components which form the mixture expand to about 10 times their original volume. Color additives can be blended with the mixture for camouflage purposes.

Breathing Easier

A battlefield resuscitator which may allow a single soldier to supervise mechanical respiration for as many as a dozen men has been designed in a joint project by the Army's Medical and Chemical Corps. Called the "Edgewood Resuscitator" and designed specifically for treatment of severe nerve gas poisoning, the unit may prove valuable in peacetime for the short-term treatment of persons whose breathing is impaired from other causes. Key feature of the apparatus which adapts it to nerve gas cases is that it rhythmically delivers a set volume of air into the lungs of the victim, despite lung resistance. As treatment lessens the resistance, the unit automatically adjusts the force behind the air accordingly. The bronchial tubes of nerve gas casualties are usually tightly constricted and conventional resuscitators would be inadequate in the treatment of severe cases.

Almost as easy as cutting cake. This soldier is using his bayonet to widen the entrance to a plastic foam tent. These shelters can be constructed in an hour and weigh less than 200 pounds.

Map Selector in Works

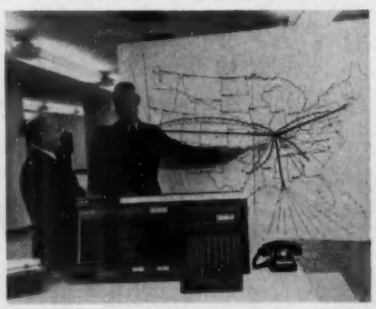
An automatic map selector, designed to select automatically the correct map from a compartment containing more than 11,000 different maps recorded on microfilm, is now being developed by Fairchild Camera and Instrument Corp. The device gives promise of easier and quicker location of distant targets by Army field commanders. The operator of the device first will indicate the map coordinates of the point to be located; within 15 seconds the device, called the Fairchild Target Map Coordinate Locator, will project the selected map on a large viewing screen. Accurate grid coordinates of any point on the screen may then be determined by the positioning of horizontal and vertical crosshairs. With the map compartment fully loaded, the selector, which weighs about one ton, should require only one-fifth the space now required for storage of the same number of standard maps. The map selectors are designed for use at field army and corps headquarters and by lower echelon units—such as an army missile unit. The selector is stocked entirely with maps of the scale 1 to 25,000.

Army Uses Space Chamber

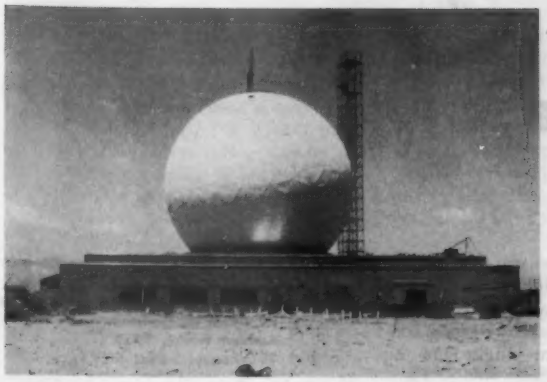
The Army Signal Research & Development Laboratory, Fort Monmouth, N. J., has put into use an improved high-altitude test chamber that duplicates conditions met by missiles and satellites 100 miles above the earth. A stainless steel cylinder 8 feet long and 5.5 feet in diameter, the chamber was built by NRC Equipment Corp., a subsidiary of National Research Corp., Newton, Mass. Atmospheric pressure in the chamber can be reduced to simulate virtually air-free environment 100 miles up, and refrigeration and heating equipment make possible test chamber temperatures from 90 degrees below zero Fahrenheit to 300 degrees above.

Speeding Up Supplies

One of the nation's most powerful electronic data processing systems, which will speed up requisitions five times faster than previous methods and save the Army $6 million a year, has been put into use at the Transportation Materiel Command at St. Louis. More than 1,000 requisitions flow into TMC's computer daily. There they are converted with speed and accuracy into shipping orders which then are transmitted automatically to supply depots throughout the country. The computer —an IBM 705 III—gets this material on the road in less than 72 hours, a cycle which used to take 15 days. Brig. Gen. William B. Bunker, TMC Commanding General, said the speed-up will make for smaller inventories which, in turn, will reduce losses due to obsolescence. It is estimated these factors will save at least $6 million annually for the next three years. Forty-five reels of the magnetic tape used by the computer



TMC's vast supply network is pointed out by Brig. Gen. William B. Bunker, Commanding General, as he and Lt. Col. Wallace R. Elliott stand in back of the IBM 705 III console.



NIKE ZEUS EXPERIMENTAL RADAR

Shown at left is an experimental model of the Nike Zeus Acquisition Radar installation at White Sands Missile Range, used in the current program of early test model firings of the Army's anti-missile missile.

contain all the necessary information about the 300,000 separate items in TMC's inventory. It would take eight miles of standard file drawers, laid end-to-end, to contain this information if it were on paper. The computer handles 10,000 transactions each 24 hours.

Breaking Heat Barrier

A rare metal, which in its pure form is worth three times the weight of gold, may help to solve the heat barrier problem encountered by electronic parts in nose cones of missiles fired into outer space. Gallium, a rare silvery metal that costs about $1,500 a pound, ordinarily melts in the hand. Phosphorus, used in matches and fireworks, will melt in the sun on a hot summer day. But gallium phosphide, a compound of those two chemical elements, will withstand temperatures up to 1,500 degrees Fahrenheit, according to Army Signal Corps tests. The Army has built an electronic diode using this material which has withstood temperatures seven times higher than silicon and germanium, previously used in electronic diodes. The material may also be used in building solar-cell power plants for space stations. Meanwhile, it is still under study to pin-point its unique properties before release to Signal Corps equipment development engineers.

"Sky Car" Gets Green Light

The Piasecki "Sky Car," wingless ground-air vehicle, has undergone a change in designation plus some other modifications, and DA has given the company the go-ahead to proceed with construction of the versatile vehicle. Known as the VZ-8P during successful early test flights totaling more than 60 hours, the aircraft has been redesignated 59-H. The basic conformation of the aircraft will be unchanged, with front and rear ducted propellers, but certain refinements are planned. The vehicle will be powered by two 425-hp Artouste II-C gas turbine engines for twin safety and reliability. The two rotors will be slightly larger and tilted to permit higher speeds. Rotor props will be metal instead of wood, co-pilot controls will be provided, and the control system will be considerably advanced.

First Flight of X-18

Hiller Aircraft's 16.5-ton X-18, billed as the Western world's largest vertical take-off and landing (VTOL) aircraft, has completed its first flight as a conventional aircraft. Stability, handling, and general flight characteristics were reported satisfactory after a 20-minute, low-speed (196 mph) test which carried the X-18 to an altitude of 4,000 feet. The X-18 can tilt its wing-engine combination to attain vertical flight and hovering, but early tests as a conventional aircraft are to obtain necessary technical data preparatory to vertical flights. The X-18, powered by 11,000-hp engines and 16-foot propellers, attained a ground acceleration of 100 mph in 4.7 seconds in its first test.

HOT SPARKS

Three contracts totaling $35 million have been awarded by the Army to Raytheon Manufacturing Co., Waltham, Mass., for work on the Hawk missile system. The contract covers missiles, field maintenance test equipment, and engineering services during calendar year 1960.

Western Electric Co., New York, has been awarded a $6 million Army contract for research and development on the Nike Hercules.

A $3.25-million Cold Regions Research and Engineering Laboratory will be constructed in Hanover, N. H., for the Army, with construction expected to begin in the spring of 1960. CRREL will combine two Army Engineers facilities currently engaged in research on snow, ice, and permafrost—the Snow, Ice, and Permafrost Research Establishment, now located in Wilmette, Ill., and the Arctic Construction and Frost Effects Laboratory in Waltham, Mass.

An $8.7 million contract for the Army's Shillelagh program has been awarded to the Aeronutronics Division of Ford Motor Co., Newport Beach, Calif. The Shillelagh is a lightweight surface-to-surface guided missile for close-in support of troops.

Dravo Corp., Pittsburgh, Pa., has been awarded a $22.8 million contract for construction of locks on the Pike Island Lock and Dam Project on the Ohio River, near Wellsburg, W. Va. The contract was awarded by the Pittsburgh District of the Army Engineers.

Martin K. Eby Construction Co., Wichita, Kan., has been awarded a $22 million Army contract for the construction of Atlas missile facilities at Francis E. Warren Air Force Base, Wyoming.

Bell Helicopter Corp., Fort Worth, Tex., has been awarded contracts totaling $26 million for follow-up production of the Army's HU-1A utility helicopter and for the development and future production of the HU-1B, a more powerful version of the HU-1A Iroquois.

OVER THE SNOW WE GO

Army engineers in the Arctic test a Snowblast machine. The giant vehicle compacts snow and spreads it into a hard and smooth surface. The area shown will be used as an aircraft runway.

THE MONTH'S BOOKS

Nickel-Nursing Defense Posture

THE UNCERTAIN TRUMPET
By Gen. Maxwell D. Taylor
Harper & Brothers, 1959
203 Pages; Index; $4.00

Reviewed by

MARK S. WATSON, *who is Military Correspondent of the Baltimore* Sun *and dean of the Pentagon press corps.*

The criticisms of the nation's current military structure, at top levels, which have been expected from General Taylor ever since his retirement as Chief of Staff of the Army last June, have now appeared in book form. In clarity, vigor, and wrathfulness they come fully up to expectation and, reaching publication just as Congress resumed, can hardly fail to meet the eyes, if not the sympathies, of defense-minded legislators.

The Uncertain Trumpet states bluntly that the Joint Chiefs of Staff set-up should be dissolved and its members sent back to head their respective services. In expressions suggestive of those used in the postwar reorganization pleas by General Marshall and his principal World War II lieutenants of Army and Army Air Forces (including General Eisenhower), General Taylor insists that a "committee" cannot reach a difficult decision quickly or firmly, and inevitably compromises or hopelessly delays on actions which should be swift and unmistakable. His recommendation is for a single Chief of Staff (from whatever armed service) with two deputies (from each of the other two services). Such a commander would have undisguised power and undoubted statutory responsibility, subject of course to the civilian authority. The viewpoints of the services would be made available by a new three-man Supreme Military Council of senior officers who, interestingly enough, would have advisory responsibility to Congress as well as to the Secretary.

General Taylor lays down the reasons for such a radical change in his fierce criticism of JCS performance during his own four-year membership. The case record is impressive, quantitatively: there were 2,954 papers receiving unanimous agreement, and only 23 disagreements. Qualitatively, the record is less impressive, for all 23 disagreements were on fairly vital issues. A further record of issues decided, in effect, by the Chairman reveals that the ex-Navy Chairman (Admiral Radford, who was not precisely a bosom friend) rarely supported the Army spokesman and almost always supported the Navy member. Reader conclusions on this point might not be unanimous.

To current budgeting methods, with dollar-economy sometimes outweighing military requirements, are attributed grave blunders of far-reaching importance, which the Joint Chiefs were powerless to avert. There is an impressive argument for a "functional" budget.

General Taylor is equally forthright in denouncing the nation's main defense policy (the National Security Council's "basic" policy is so vaguely stated, he insists, as to produce "an uncertain sound" from the High Command's trumpet). The main policy is a reliance upon massive retaliation powers, so largely as to undervalue the weapons and formations required for a much likelier limited war —or indeed for any kind of prolonged war. He contends that such a policy threatens seriously to lead either toward the all-out sort of war we least desire or toward "compromise and retreat." The former Army Chief argues persuasively, rather, for a defense policy permitting a "flexible response" to aggression; that is, one which will meet force with adequate force but neither too much nor too little. In such a policy, he insists, there actually is far greater power of war deterrence, as well as far greater power in war itself. Concentration for one vast blow, apart from its other demerits, he compares to a prize fighter's training not for a full bout but for the first round only.

No small part of the book records explicitly the successive dollar-saving steps which have seriously weakened the Army and which now, General Taylor feels, call for the early corrective steps he urged while in office: 925,000 men (averting the prospective inactivation of yet another combat division), rapid modernization, greater mobility, swifter development of Nike-Zeus as the only contemplated defense against the ICBM, better defense of our own warmaking resources.

The argument is strongly for a "national arsenal" concept to guide all the services impartially, with the Joint Staff advising as needed which service should operate which weapon. An extremely timely presentation of what General Taylor regards as a vital and urgent issue calling for swift and determined action.

The Danger We Face

THE QUESTION OF NATIONAL DEFENSE
By Oskar Morgenstern
Random House, 1959
306 Pages; Index; $3.95

Reviewed by

HERBERT E. STRINER, *who when he wrote this review was on the staff of the Army's Operations Research Office of The Johns Hopkins University. He is now with Brookings Institution.*

After reading this book, one cannot help but feel a mixed sense of elation and bitterness. Professor Morgenstern has written a brave and brilliant critique of our nation's military preparations and policy which leaves this reader with a feeling of how much more could be done to improve our country's position to counter the Soviet menace were it not for the myopic policies now being pursued by the Government.

In all that is said in this book, there are two major messages: first, we must develop an invulnerable retaliatory force, which we do not presently have; second, we are capable of supporting economically and financially the means to attain a proper defense posture.

The major goals which Dr. Morgenstern sees as not only being possible, but also as essential to our defense posture, center about a concealed, mobile retaliatory force; increased ability to wage limited wars; ability to fight a "broken-back war;" a shelter program. In addition, his discussion of the lead-time problem, needs for long-range budgeting, lack of imagination in waging cold war and limited war, the poor control of dissemination of classified information, and shortcomings in foreign policy all add up to an indictment of those who have been instrumental in bringing this nation to its current point of peril. The wide-ranging nature of this work in no way limits the major burden of what is said.

With respect to a concealed, mobile retaliatory force capable of an effective response in a thermonuclear war, the author's position is that the Polaris weapons system, submarine-based, is the undisputed answer. Additionally, seaplanes and ship-platforms would provide other forms of easily dispersed, difficult to detect, sources of nuclear retaliation. Short of fulfillment of this goal, we must increase the effectiveness of SAC.

By this is meant more planes aloft, ready to strike.

Our current ability to fight limited wars is in serious doubt, according to Dr. Morgenstern, and yet with a stalemate in nuclear arms this is exactly the sort of situation which is most likely to develop. Here, it is suggested, because of our inability to cope with the limited wars which nibble away at territory and alliances, if we feel that success can be gained only by using nuclear and thermonuclear warheads, we may be the ones to "bring the big war." How ironic this would be, if our nickel-and-dime economizing forced us into an all-out war because we didn't have the political guts to amply finance limited-war forces! Since its inception, each year has seen cuts in the Strategic Army Corps, ignoring of pleas for adequate airlift, and little or no funds for modernizing the Army.

On the question of fighting a broken-back war, or one in which we continue hostilities after a major degree of destruction and a thermonuclear exchange, Dr. Morgenstern adds a dimension frequently lacking in other general discussions of our defense posture. On this question of surviving and prevailing the author indicates we are not prepared. Indeed, he correctly claims we have not even thought about it much. This part of his book leads us into an astute analysis of a shelter program, an underground-facilities "economy," and a future research and development program. For all these measures, as well as a more adequate defense system along the usual military hardware lines, Dr. Morgenstern unhesitatingly states that our economy and financial resources are up to the task. This is of major importance when one remembers the reputation of the author in the field of economics. Properly so, he expresses his frustration and anger with those in Government who, without any real competence to support their position, feel that our economy could not stand the strain of additional taxes or output necessary to provide an adequate defense system. This whole dollars game is so tragic when we realize that the Soviet Union, with a gross national product which is less than that of the United States, is allocating about 30 per cent of its national output for military expenditures. Currently we are allocating about 9 per cent of our greater GNP —and we are told this amount is all we can afford.

After reading this book, there is both a sense of gratitude for its having been written, and a sense of hopelessness that those who most need to read it probably will not. This is especially so because the author does not close with a conclusion that all will be sweetness and light because our cause is the just and righteous one. With no change in attitude on the part of our leaders ". . . then this country is at the most difficult point in its long and glorious history. It is approaching a peak of danger the like of which has never been experienced by a great nation." If these tragic events should come to pass, that group of which Dr. Morgenstern is one, at least will know that in having lost the battle by default, no blame can fall on their shoulders.

Something for Everyone

COMMAND DECISIONS
Prepared by the Office of Chief of Military History
Harcourt, Brace & Company, 1959
481 Pages; Maps; Index; $5.95

Reviewed by

BRIG. GEN. EDWIN H. RANDLE, *who held command positions in the Northwest Africa Theater and in the Pacific during World War II.*

This volume is a department store, a historical grab-bag. It has something for everyone.

Would you like to know more of the historical development of the "Germany First" concept of our World War II policy? Or what led to Japan's decision for war, documented; or who chose Bataan, and why? Perhaps at the time you were too busy to give much thought about who finally decided to evacuate Japanese-Americans from our Pacific coast. Are you hazy about the genesis of the Torch (Northwest Africa) decision? These and the other 15 command decisions discussed in this book were not simple, cut-and-dried, we-will-do-this decisions. Mostly they were fairly complex with many divergent points of view to compromise, beat down, or reject. The different points of view are discussed, if not exhaustively, at least adequately, with 51 pages of footnotes and 15 sketch maps.

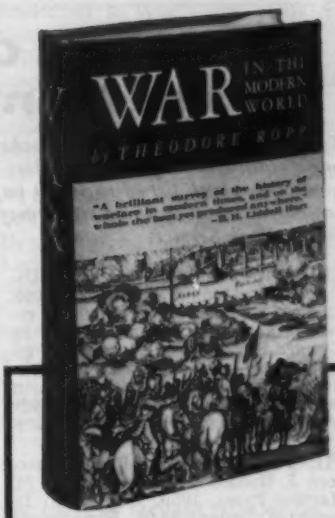
A few essays concern decisions which at the time were obscure and now are mostly forgotten. Such was the one to open the Persian Corridor as a substitute for the disastrous convoy route to Murmansk and Archangel through the deadly Arctic Ocean and the White Sea. Or decisions forced by logistics, or lack of landing craft, or want of shipping.

The publisher's blurb on the jacket says "Twenty Crucial Decisions that Decided the Outcome of World War II." Well, most publishers' blurbs exaggerate, and this is no exception. Accuracy would have been better served by the omission of "That Decided the Outcome." One or two of the decisions did not even contribute toward winning the war.

Certainly the decision to evacuate Japanese-Americans from our Pacific Coast had no effect on the war's outcome. Did the German invasion of Norway and Denmark? General Lucas's at Anzio? General Bradley's decision at Argentan? What about the decision finally to go ahead with Anvil (Southern France)? Or General Clark's decision to render only token obedience to Alexander's order to make his main effort against Valmontone? Or the decision to launch Market-Garden (the airborne assault of mid-September 1944, in conjunction with British Second Army's ground attack)? None of these decided the outcome. Perhaps it can be said that the sole decision discussed that really determined the war's outcome was that which at last firmed Overlord (Normandy) against British-pressured peripheral attacks on the "soft underbelly" of Europe—which was never really soft at all.

This is a collection of 20 essays, several of which have been published elsewhere, and others are to be included in forthcoming histories. It was edited by Kent Roberts Greenfield, and Hanson W. Baldwin contributes a fine introduction. The title page lists the 16 contributors, all of whom are now working, or have worked, in the Army's Office of the Chief of Military History.

Comparisons, however odious, are made possible by some essays. For example, General Clark on Anzio with General MacArthur on the Admiralties. Each commander was faced with an opportunity. MacArthur hastily seized his. But though Fifth Army was stopped along the Rapido, and had been for quite some time (whereas at Anzio the landing of VI Corps was unopposed), no effort



"A brilliant survey of the history of warfare in modern times, and on the whole the best yet produced anywhere."—B. H. Liddell Hart

War in the Modern World

by Theodore Ropp

$10 from Dept. B

DUKE UNIVERSITY PRESS

College Station Durham, N. C.

Selected Check List of the Month's Books

This run-down of some of the books received during the month preceding our deadline is to give our readers who like to follow current literature a monthly check list of the most important, useful and potentially popular books. Any of these titles may be purchased through the Combat Forces Book Service.

CUSTOMS OF THE 15th U. S. INFANTRY. Hope Farm Press, 1959. 41 Pages; Paper, $5.00. Facsimile reproduction with a historical essay by Edward Sprague Jones, of the original printed in China during the thirties. Includes all Medal of Honor awards, unit citations, campaign credits, books on regimental history.

FIRST INTO OUTER SPACE. Theodore J. Gordon & Julian Scheer. St. Martins Press, 1959. 197 Pages; Illustrated; Index; $3.95. Experiences of the Douglas engineer who was test conductor of the three USAF space probes. This is the account of how Missile 130 was projected.

FLATTOP. Barrett Gallagher. Doubleday & Company, 1959. 128 Pages; Illustrated; $5.95. The carrier in action and the changes in design and operation that led to the new era of atomic carriers. Foreword by Admiral Burke, text by prominent Navy officers.

THE HERO: Charles A. Lindbergh and the American Dream. Kenneth S. Davis. Doubleday & Company, 1959. 527 Pages; Index; $4.95. A biography of Lindbergh the man, which does not overlook his work with Carrel, the America First period, the debate over aid to Britain, and his service during WWII. By the biographer of Eisenhower and Adlai Stevenson.

AN INTRODUCTION TO ELECTRONIC DATA PROCESSING. Roger Nett & Stanley A. Hetzler. The Free Press, 1959. 287 Pages; Illustrated; Index; $6.75. For those who will have to decide whether or not to adopt computers for their research organization, business, or government agency. Describes technology, techniques, economy, and personnel problems of computer research.

THE MARCH UP COUNTRY. W. H. D. Rouse. New American Library, 1959. 192 Pages; Index; Paper, $.50. A translation of Xenophon's *Anabasis*—the great historian and military commander's account of how 10,000 Greeks stranded in enemy territory fought some 1,500 miles back home. One of the greatest true adventures of all time.

McKAY'S GUIDE TO ALASKA. Robert G. Hart. David McKay Company, 1959. 330 Pages; Maps; Index; $5.00. A comprehensive travel guide with up-to-date information on living conditions. The author has lived there.

MOST DANGEROUS SEA. Lt. Comdr. Arnold S. Lott. U. S. Naval Institute, 1959. 322 Pages; Illustrated; Maps; Index; $6.00. A history of naval mine warfare, from ancient times through the Civil War, the World Wars, and Korea. Appendices include valuable statistics on ship losses and casualties.

A TECHNICAL WRITER'S HANDBOOK. Margaret Norgaard. Harper & Brothers, 1959. 241 Pages; Index; $3.75. Help for engineers, scientists, businessmen, and government workers (including military writers) in preparing clear reports, planning effective visual presentations, and writing speeches.

THE WORLD'S FIGHTING PLANES. William Green & Gerald Pollinger. Hanover House, 1959. 240 Pages; Illustrated; Index; $3.50. Third, completely revised edition of a comprehensive reference on modern military aircraft. Contains 262 photos and 188 three-view silhouettes of every plane in use.

was ever made—from all evidence in this book it was never thought of—to hastily switch the center of gravity of Fifth Army from the Rapido to Anzio, leaving only a holding force and taking advantage of those days of non-resistance to transfer everything that could be pried loose, even bits and pieces of units.

The hindsight of nearly everyone is superb, and this book encourages it. Also, it impresses the reader with how many times American commanders were caught flat-footed, not by the enemy, but by their own unexpected successes.

It would be fascinating to watch Anzio being wargamed, with troops on both sides, and conditions as they were. Then change the conditions and do it over, again and again. Anzio had one effect unknown in Italy. While planning for Okinawa during early 1945, General Buckner told me: "They want me to make an assault landing on the south end of the island [Okinawa]. I'm not going to do it. I'm not going to have another Anzio on my hands." And he didn't. Instead, day after day of straight frontal attacks pounded down the island. No landing anywhere on Okinawa would have ever become an Anzio.

"The Decision to Withdraw to Bataan" dispels some of the haze which has surrounded MacArthur in the Philippines before Pearl Harbor, and just after. It is interesting to follow his pre-Pearl Harbor fight against the strictly defensive Bataan concept and plan; then to observe how in the end he was forced into it by the Japanese and his own overconfidence in the native army he had built. Somehow, the reader is reminded of "the different war" when masses of Chinese crossed the Korean border.

It has been given to few American officers to close the pincers and by one grand maneuver capture huge numbers of the enemy. Pershing almost did it at St. Mihiel, and Bradley almost did it at Argentan. In the earlier days of World War II, the Germans did it time after time against the Poles, but they had carefully studied the battle of Tannenberg. There the Germans did it twice as one operation. With one glance Ludendorff and Hindenburg threw out Moltke's plan to withdraw, then drove between two Russian armies and encircled each in turn.

One essay describes General Bradley's decision at Argentan. He failed to close the pincers. He ordered XV Corps to halt 15 miles short of closure, though they could have easily gone on, and between 20,000 and 40,000 Germans escaped. Why did he stop XV Corps? This study ventures a number of reasons, none of them to me convincing. Let's say that because of the fog of war and a conflict of personalities the best decision was not made. "General Bradley himself later considered the failure to close the gap a mistake." However, the author of this essay disagrees, and in justification gives his reasons. (1) "He [Bradley] remained within the operational framework established by his superior [Montgomery] . . . both in terms of boundaries and objectives." Neither boundaries nor objectives are sacrosanct. A telephone call outlining the great opportunity would have brought permission to violate either. The call was never made. An officer of lesser rank surely would be relieved for failure to inform his commander of a great opportunity, and request permission to cross a boundary. Or if he crossed without permission and was successful, he would have nothing to fear but showers of congratulations and citations, perhaps even a promotion. (2) "He [Bradley] achieved security . . . by sacrificing offensive maneuver and thereby prevented what could have been a disastrous over-extension of XV Corps." I think that last one at Leavenworth would be assured of a big fat U. In another place the author indicates that failure to close the gap did not much matter because those Germans who escaped were mostly rounded up on the Seine anyway. That is like saying that Meade's failure to pursue after Gettysburg was unimportant because later on Grant captured all of Lee's forces. Perhaps a military historian should play it safe, present the facts as best he can determine them, and let his readers draw their own conclusions.

The student of military history, even the casual reader who finds interest in World War II, will thoroughly enjoy this book. It lets him peep behind the scenes, besides being highly informative. But it only scratches the surface. Many other command decisions await study, and many similar books could be compiled. As I read *Command Decisions* there kept coming to mind a sign I once observed in a commercial establishment: THE BOSS ISN'T ALWAYS RIGHT, BUT HE IS ALWAYS THE BOSS.

The Best on Stonewall

STONEWALL JACKSON
By Lenoir Chambers
William Morrow & Company, 1959
Two Volumes; 597 and 536 Pages; Illustrated; Maps; Index; $20.00

Reviewed by
VIRGIL CARRINGTON JONES, *Past President of the D. C. Chapter of the Civil War Round Table, author of several works on the Civil War, and member of the Civil War Centennial Commission.*

After Colonel Henderson's *Stonewall Jackson and the American Civil War* and Frank Vandiver's *Mighty Stonewall*, what is there new to write about this scourge of the Federals who became one of the greatest generals in history?

The answer is given by Lenoir Chambers in his new two-volume biography, *Stonewall Jackson*, a careful study that took more than 12 years to prepare. Here is the best-balanced book on the subject so far in print. In its pages are found a more exhaustive treatment of Jackson's personal life, a fine analysis of the impact of his operations, and an intimate account of his relationship with other officers who served with him.

In all the reliving of the War of the Sixties, no one denies that Jackson was Lee's right arm, but there have been varying opinions as to what that right arm was like, its strongest influences, and just exactly what made it perform in a manner that set it apart in history. Chambers, a professional journalist and editor, has gone into a deliberate and well-planned discussion of some of these enigmas surrounding the strange leader who, after training himself throughout an earlier career of 37 years, took only two years to add immortality to his name.

Jackson was a person whose human frailties were submerged by all the many traits which combined to make him great. His life can be cited to youngsters as that of a backwoods youth who attained his goal. Perseverance was his dominant trait. As early as ten years before the war he began to shape himself to become a better soldier. His very existence was regulated by his mind, and his mind was regulated to attain an end. He regimented himself to the degree of a fanatic, dividing his time between religion, study for self-improvement, and exercise to correct physical weaknesses.

Jackson's adherence to a routine of stern regimentation, his self-denial to offset the deficiencies of poor eyesight, his simplicity of character, and many other admirable characteristics have a tendency to influence idolatry on the part of a biographer. This is not true with Mr. Chambers. He depicts Jackson in clear, sharp, human focus. The strange man who at 39 was given nicknames that implied a much more advanced age is made to stand out with less mystery about him, and his military actions are shown to have been based on a combination of inspiration and logic.

"He swept into the war," writes Mr. Chambers, "with cool professionalism, with authority and confidence in himself, with a knowledge of his own mind and a sense of discipline, with the complete conviction that this was a very tough job indeed for the South, with a head full of ideas, and with the determination to go right ahead and to keep on going right ahead. The combination was almost unique in Virginia, in the Confederate States, or, for that matter, in the whole country. When the war did come, this officer was ready for it in the most emphatic sense."

At no time in this two-volume work is the great Confederate general brought more alive than in his dealings with his fellow officers. Chambers writes as a biographer, in a straightforward narrative style. He tells in plain and simple language of the great tributes paid Jackson by Lee. And he describes Jackson's friendship for Jeb Stuart, around whom Stonewall was more informal than in the presence of any other officer, regardless of rank.

In his exhaustive research into the background of Jackson—the 37 years that passed before he attained the success that he obviously had in mind from boyhood—Mr. Chambers examined many sources. Among these was even Jackson's own library, which the author carefully pored over in the hope of finding hidden among the pages some additional clue to explain the strange characteristics that marked the man.

In only one instance can I find the author in error, and that lone distortion of fact is easily understood and easily forgiven. It is a trap by which other writers interested in Jackson, notably Henry Kyd Douglas, who fought with Stonewall, have been deceived. The reference is to the statement by Mr. Chambers that, while Jackson lay around Gordonsville in the summer of 1862, John S. Mosby, later the feared Confederate partisan leader, passed through with a letter of introduction from Stuart. Such a letter was written, but it never reached Jackson, as this implies, because Mosby was captured en route, and he and the letter were hauled off to Washington, many miles short of their destination.

Both volumes of this biography are supplied with illustrations and maps, and both are generously sprinkled with anecdote. The first is devoted to Jackson's early career and his rise to public attention through the astounding success of his campaigns in the Shenandoah Valley. In the second, opening with the Seven Days battles, he is depicted in his role of Lee's tactician, a service that concluded with his death following Chancellorsville.

The author has a solid, descriptive style, devoid of fancy writing. He is fair and practical in his treatment, evincing a desire to make a great contribution to Civil War literature. In my opinion, he has eminently attained his goal.

U. S. Development

THE AMERICAN HERITAGE BOOK OF THE PIONEER SPIRIT
By the Editors of American Heritage
American Heritage, 1959
400 Pages; Illustrated; Maps; Index: Cloth, $12.95; De Luxe, $14.95

Reviewed by
COL. R. ERNEST DUPUY, *distinguished Army historian, who has written many articles and reviews for* ARMY.

Once in a blue moon along comes a book which by happy combination of subject, content and treatment, baffles the reviewer. This is one of them.

Here is the story of the emergence and development of the United States. In it is nothing which one could not, by assiduous digging, cull out of the encyclopedia. In fact, since the book treats of every aspect of our nation—geographic, historic and economic—it is in essence an encyclopedia. And it could have been, through its very nature, very dry reading indeed.

But it isn't. From cover to cover and on every page between, the reader becomes excited and enthused. It has all the whang and bang of the old-fashioned Fourth of July celebration. It's a book for the boy you want to see grow up a good American citizen, justly proud of his heritage; and it's one to send to Mr. K with the simple three-word taunt: "Tie this one!"

One thin blue thread is woven unobtrusively through this pattern: the Army, guiding and guarding, exploring and protecting the pioneering urge which made our nation great.

Dr. Allan Nevins, Columbia University's historian, writes the historical prologue to each of the 11 chapters. Alvin M. Josephy, Jr., Peter Lyon and Francis Russell have done a superb job of compiling the body of the work. The editors of *American Heritage* have accomplished a masterly task in selecting the amazingly interesting collection of maps, color prints and photographs which illustrate the book.

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The Association of the U. S. Army shall be an organization wherein all who are in accord with its objectives may join in the exchange of ideas and information on military matters, and in fostering, supporting, and advocating the legitimate and proper role of the Army of the United States and of all its elements, branches, and components in providing for and assuring the Nation's military security.

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CHAPTERS

BERLIN CHAPTER—New officers elected 4 December. Brig. Gen. Charles E. Johnson, retiring President, spoke on "The Reason for AUSA."

BRAXTON BRAGG CHAPTER—Col. Thurston T. Paul, Deputy CO, Army Ballistic Missile Agency, impressed the Chapter with the need for funds as well as good intentions if we are to lead in missiles and space, and stressed the requirement for basic research, at a dinner meeting on 1 December. Colonel Paul's presentation was followed with a question-and-answer period. Mr. J. W. Pate, Mayor pro tem of Fayetteville, introduced Colonel Paul after a demonstration by the 2d Airborne Battle Group's precision drill team.

CENTRAL OKLAHOMA CHAPTER—MSgt. Roy Brattain, Jr., spoke on AUSA's Annual Meeting at meeting on 16 December. Officers were elected for coming year.

CHARLOTTESVILLE CHAPTER—Lt. Gen. Walter L. Weible, Executive Vice President, AUSA, formally presented the charter to the Chapter at a dinner meeting on 7 December at Alumni Hall, University of Virginia.

COASTAL EMPIRE CHAPTER—More than 400 attended the Charter Meeting on 7 December at Fort Stewart. Lt. Gen. Manton S. Eddy, a Trustee of the National Association, presented the charter and made the principal address, during which he stressed the role of the foot soldier in modern warfare. The first public showing of a new film, "The Army—Deterrent to Aggression," exhibits and displays, and refreshments rounded out the program. Lt. Gen. Joseph B. Fraser, Hinesville, was elected President. The Hon. Prince Preston, U. S. Representative from Georgia's First District, and the Hon. Fred W. Mingledorff, Mayor of Hinesville, attended the meeting.

DIX CHAPTER—New officers elected at meeting on 10 December, after a talk by Maj. Gen. Sidney C. Wooten on the necessity for support of AUSA.

EAST BAY CHAPTER—Directors' meeting on 16 December decided to arrange for widespread showings of film, "The Nike Hercules Story," with opening and closing speeches by Air Defense personnel.

FORT LEONARD WOOD CHAPTER—Mr. William Courtenay, who has spoken to many AUSA Chapters, came to Fort Leonard Wood under AUSA sponsorship and spoke to six different audiences, totaling more than 4,000 officers and men, on 6 and 7 December. One of his audiences was the Chapter's quarterly meeting, at which he spoke on "The Berlin Situation and NATO"; his other talks were on "The Primacy of the Soldier in Modern War."

FORT RILEY-CENTRAL KANSAS CHAPTER—The Hon. Frank Carlson, U. S. Senator from Kansas, spoke to more than 500 members and guests at an open meeting and barbecue on 7 December, stressing that alertness and awareness, rather than defeatism, were indicated for this period of the nation's history. The Chapter made four awards to local civilians; Maj. Gen. Harvey H. Fischer presented the Department of the Army's Certificate of Appreciation to Mr. Lee Rich, manager of the *Junction City Union*.

FRANKFURT CHAPTER—Meeting on 15 December at Frankfurt Casino featured training display and explanation of missiles,

NEW YORK UNIVERSITY HEIGHTS COMPANY—From 1700 20 November to 1800 22 November, Heights Company (including pledges) worked on continuous shift at the New York City Muscular Dystrophy Telethon, after spending part time for a week before the Telethon helping with clerical work. The Company worked with Pinkerton detectives and other security guards, plus the Police Department, and performed additional duty as escorts for TV personalities. Jerry Lewis will present the Company with a gold plaque for its efforts. Local publicity was voluminous.

SIOUX COMPANY, University of North Dakota—Commander Charles W. Bullard, USNR, spoke to the Company on 8 December on the role of sea power in national defense.

SOONER COMPANY, University of Oklahoma—Thirty-three members visited the U. S. Army Air Defense Center at Fort Bliss, during 10-12 December. The AUSA members were briefed on Missile Master and Missile Monitor, toured the electronics laboratories, and were briefed on a wide range of Army missiles and equipment.

CHICAGO, ILL. Capt. Howard F. Kessinger (second from left) explains new USMA admissions program to representatives of Chicago Area Chapter and Chicago Chapter of West Point Society. Others are, left to right: Maj. Robert F. Tansey, USMA liaison officer; Col. T. J. Ryan, Secretary-Treasurer of Chicago Area Chapter; Brig. Gen. Lawrence H. Whiting, Vice President; Col. W. L. Slisher, Chief of Information, Fifth Army; Col. J. C. Raaen, Chicago Chapter, West Point Society.

FORT ORD, CALIF. Frank J. Buckley (second from left, front) with a group of business and industrial leaders who recently observed new basic training methods as guests of Greater Los Angeles Chapter. Front row, left to right: Wade Bennet, Hollywood financier; Mr. Buckley; Joe Micciche, Acting Director of Civil Defense for Los Angeles; Maj. Gen. Leroy H. Watson, member of the Chapter's Board of Directors. Rear: Harold Schaffer and Bill Campbell of the LA Junior Chamber of Commerce.

FORT CARSON, COLO. Joseph A. Reich, Chairman of the Military Affairs Committee of Colorado Springs Chamber of Commerce, speaks during the kick-off dinner before the premiere of the Pikes Peak Army Exhibit. Also at head table are (left to right) Samuel F. Downer, National Vice President of AUSA; Walter K. Koch, Civilian Aide to the Secretary of the Army; Lt. Gen. Charles E. Hart, CG, USARADCOM, under whose supervision exhibit was staged.

FORT KNOX, KY. Brig. Gen. Dillman Rash (left), CG, 100th Division and newly elected President of Kentuckiana Chapter, receives gavel from retiring President, Col. Arthur Bonnycastle.

FORT SILL, OKLA. Sgt. Maj. Ted G. King, chairman of hospitality committee of Southwest Oklahoma Chapter, reads his committee's reports at fall meeting in Snow Hall Auditorium on 8 October.

READING, PA. Maj. Gen. A. J. Drexel Biddle, National President, presents AUSA plaque to officers of Reading Chapter at charter banquet on 15 October. Officers are, front: Lt. George E. Mack, Treasurer, and Lt. Col. Robert L. Reber, President. In rear are CWO Forrest D. Fleishood, Secretary; John A. Kunkleman, military editor of Reading Eagle, First Vice President; Maj. James C. Fitzpatrick, Second Vice President.

plus illustrated presentation on Hawk and Lacrosse. New officers installed.

GREAT PLAINS CHAPTER—Social meeting, with 150 members and 170 guests present, held on 4 December at Naval Officers Club. Executive Committee meetings on 27 November and 17 December planned for that meeting and additional projects.

HENRY LEAVENWORTH CHAPTER—Dinner meeting on 3 November heard Col. Joseph T. Caples, CO of the post hospital, Brig. Gen. Strom Thurmond, USAR, who was attending a course at the School, and Brig. Gen. Frederick R. Zierath.

INDIANA CHAPTER—The Hon. William G. Bray, Representative from Indiana, reported on a recent trip to Africa on 17 December. Mr. Bray, who represents the 7th District of Indiana, praised the U. S. MAAGs, and permitted a question period that covered a wide variety of topics, from USAR matters to the key role of the soldier.

MANNHEIM CHAPTER—Joint dinner meeting with 8th Infantry Division Chapter on 14 December heard Gen. Clyde D. Eddleman speak on "Our Mission for 1960."

MOTHER LODE CHAPTER—Annual Dinner Meeting on 7 December heard Maj. Gen. Clifford C. Mudgett, Deputy Commander for Reserve Forces, Sixth Army, speak on "The Civilian Soldier is our Defense." Attendance included 145 members and 102 guests. Extensive displays, and presentation of awards to Brig. Gen. A. M. Shearer and Capt. Robert McMorrow, were features of the meeting.

NEW ORLEANS CHAPTER—Mr. Frederick von Saurma, Chief of the Weapons System Office at U. S. Army Ballistic Missile Agency, spoke to the Chapter on 19 November and presented two late films on space; his presentation was followed by a question-and-answer period. About 335 members attended the luncheon meeting, which received wide press coverage.

ORLEANS CHAPTER, France—More than 100 members heard, on 14 December, Captain de Seroux, French Army, discuss organizational and functional concepts of the French Army.

POCONO MOUNTAINS CHAPTER—The Hon. Daniel J. Flood, Representative from Pennsylvania, addressed the Chapter on 11 December at Kingston, Penna., stressing the importance of AUSA to national defense and to the Army. Refreshments were served following the meeting.

ST. LOUIS CHAPTER—Mr. William Courtenay addressed luncheon meeting on 8 December on "The Berlin Situation and the President's Visit."

SAN BERNARDINO COUNTY CHAPTER—Meeting on 5 December was primarily social, with tributes to departing members, entertainment by choral groups from Barstow High School, dancing, drawing for door prizes. Short business meeting considered only urgent business.

3d ARMORED DIVISION CHAPTER—Meeting on 4 December discussed advisability of dividing the Chapter into regional sections because no hall in the area was large enough to hold more than one-quarter of the chapter members. Brig. Gen. Francis Hill, CG, Division Artillery, spoke on civil affairs activities and control of refugees in Korea.

3d INFANTRY DIVISION CHAPTER—Chapter follows policy of spreading meetings around Division area for easy accessibility of Chapter members; last three meetings were held in Aschaffenburg, Bamberg and Schweinfurt, on 23 July, 15 October and 12 December.

TWIN CITIES CHAPTER—Maj. Gen. William W. Quinn, Chief of Information, U. S. Army, spoke on "The Ultimate Weapon—the Ground Soldier," at 4 December meeting.

UTAH CHAPTER—A stellar audience, including Lt. Gen. Robert H. Cannon, CG, Sixth Army, and the Hon. George Dewey Clyde, Governor of Utah, attended 11 November meeting at Fort Douglas. General Cannon spoke on the One Army theme. Col. Calvin A. Behle, who attended the Special Army Information Course at Fort Leavenworth, also spoke.

WILLIAM PENN CHAPTER—Speakers at 9 December meeting, held at Frankford Arsenal, were Mr. Leonard Drake, Executive Director of Economics and Taxation Council, Greater Philadelphia Chamber of Commerce, and Capt. J. G. Driskill, Admissions Department, USMA. The meeting was the occasion for the presentation of a Certificate of Recognition to Capt. Robert Brockman, USAF, for being the first jet pilot to make an emergency escape from a disabled jet using the new rocket catapult device designed and developed at the Arsenal.

ROTC COMPANIES

BULLDOG COMPANY, College of A&M, University of Puerto Rico—Col. Manuel Font, first PMST of the College, and President of Antilles Chapter, AUSA, presented charter to Bulldog Company on 25 November. A reception followed the ceremony.

CHIEFTAIN COMPANY, Seattle University—Forty-seven new members and 17 present members viewed a film on the 82d Division in World War II at the Fort Lawton Officers Club on 23 November. Company entered a float in the University pep rally, assisted in organizing a series of lectures on "Current Political Thought," and sponsors volley ball and basketball teams.

CLARKSON COMPANY, Clarkson College of Technology—Company viewed film "Pentomic Army" on 18 October, followed by business meeting.

COLORADO STATE UNIVERSITY COMPANY—Walter R. Benson, Professor of Chemistry and holder of the Black Belt in judo, demonstrated judo to meeting on 3 December.

COUGAR COMPANY, Washington State University—Brig. Gen. Daniel A. O'Connor, CG, 31st Artillery Brigade, gave a presentation on Army Air Defense, with films and other training aids, at meeting on 17 November. Program was preliminary to visit to a Nike site on 5 December.

DICKINSON COLLEGE COMPANY—Twenty-seven new members initiated on 8 December.

EVERGREEN COMPANY, Eastern Washington College of Education—Col. Merrit A. Johnson, CO, 2d Battle Group, 161st Infantry, WARNG, spoke on 1 December concerning the role of the National Guard. Company visited Nike site on 13 November; sponsored blood-donor drive on campus on 11 December.

IDAHO STATE COLLEGE COMPANY—Capt. Frederick A. Hunter, Company Adviser, a participant in Exercise Dry Hills, spoke on the preparations for troop tests and how they are related to maneuvers. His talk had specific reference to the Atomic Flash Warning Troop Test.

KANSAS UNIVERSITY COMPANY—Company heard presentation on 17 November on Marine Corps, and on 16 December on sea power.

LT. CHARLES J. FITE COMPANY, Gettysburg College—Capt. Charles H. Auer, Company Adviser, showed film, "History of the U. S. Army Uniform," to Company on 10 December at meeting which also inducted eight members into the Company. Meeting was combined with Scabbard and Blade assembly.

MONTANA STATE UNIVERSITY ARMY ROTC COMPANY—Company heard a lecture and discussion on the duties of an Army Reserve lieutenant by Lieutenant Colberg, a recent graduate of Montana ROTC. Question-and-answer period proved very valuable for advanced cadets interested in the Reserve.

FOR "SCIENTIFIC KNOWLEDGE AND ABLE LEADERSHIP" On October 5, 1959, the Army's Distinguished Civilian Service Award was presented to Dr. James W. McRae, Vice President of the American Telephone and Telegraph Company.

The award was given for his aid in directing the creation of a family of small, tactical nuclear weapons while he was president of Sandia Corporation—a nonprofit Western Electric subsidiary under contract to the Atomic Energy Commission.

Dr. McRae is presently A.T.&T.'s co-ordinator of defense activities.

The citation was read by Lt. Gen. Arthur G. Trudeau, Chief of Army Research and Development, and said in part: "His scientific knowledge and able leadership have contributed materially to the development for the Army of small, tactical nuclear weapons, thereby significantly increasing the Army's capability to carry out its combat mission."

Bell System people everywhere are proud of Dr. McRae's recognition. And they are proud, also, that the skills and experience they apply in telephone work are also useful in the nation's defense.

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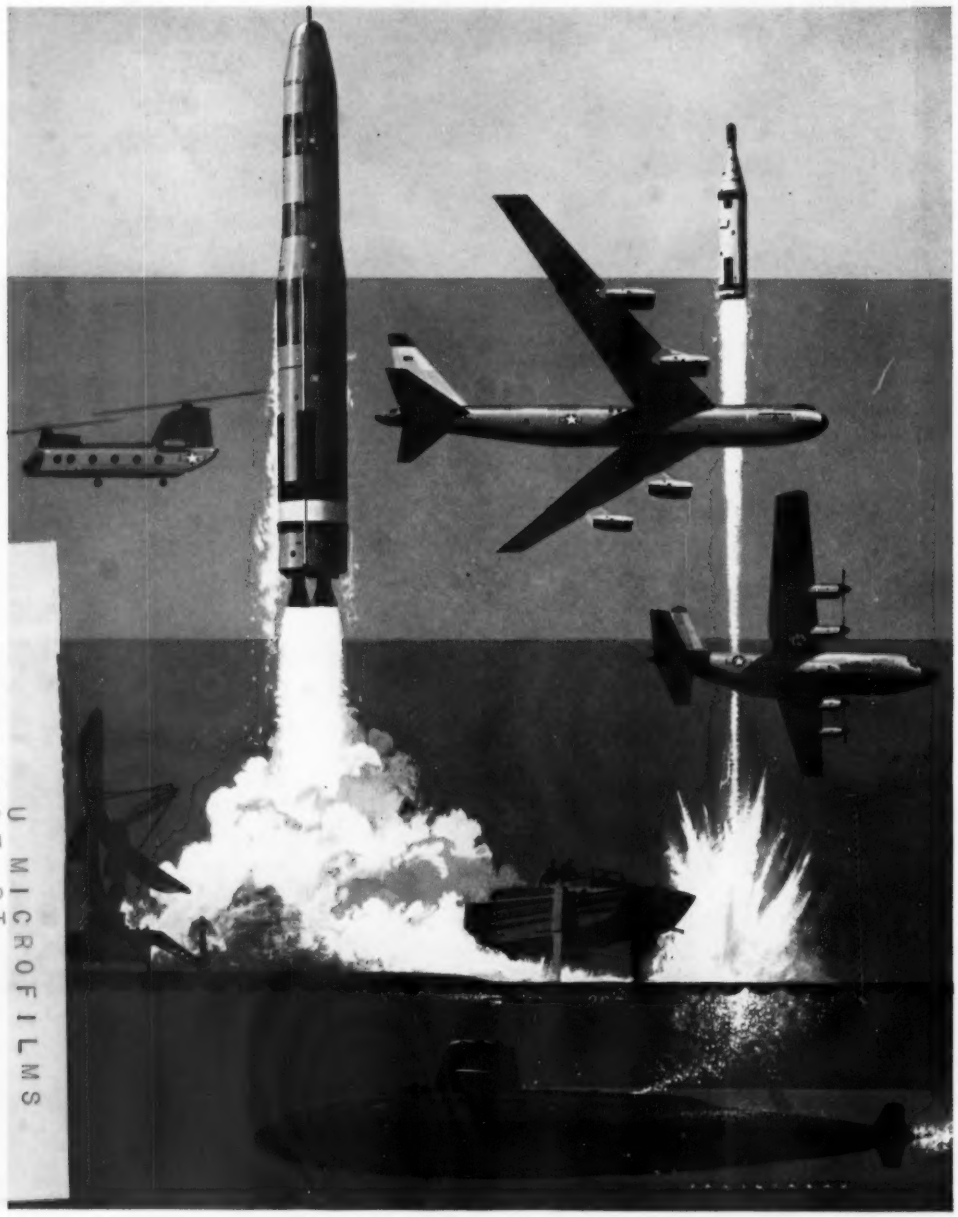

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